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44



STONYHURST COLLEGE  
OBSERVATORY.

RESULTS

OF

METEOROLOGICAL, MAGNETICAL,

AND

SOLAR OBSERVATIONS

BY THE

REV. W. SIDGREAVES, S.J., F.R.A.S.

1891.

CLITHEROE:

PRINTED BY PARKINSON & BLACOW, TIMES OFFICE.

1892.



GEN.  
Whelan

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# Stonyhurst Observatory.

Lat. 53° 50' 40" N. Long. 9m. 52s. 68. w. Height of the Barometer  
above the sea, 381 ft.

## METEOROLOGICAL REPORT.

JANUARY, 1891.

Results of Observations taken during the Month.	Mean for the last 44 Years.
Mean Reading of the Barometer.....29·658	29·439
Highest                    ,,                   on the 14th ..30·299	30·290
Lowest                    ,,                   on the 20th ..28·927	28·570
Range of Barometer Readings ..... 1·372	1·720
Highest Reading of a Max. Therm. on the 29th 50·4	51·6
Lowest Reading of a Min. Therm. on the 17th 11·0	20·9
Range of Thermometer Readings..... 39·4	30·7
Mean of all the Highest Readings ..... 40·7	42·3
Mean of all the Lowest Readings ..... 28·5	32·6
Mean Daily Range ..... 12·2	9·7
Deduced Monthly Mean (from Mean of Max. and Min.) ..... 34·4	37·1
Mean Temperature from dry bulb ..... 34·4	37·1
Adopted Mean Temperature..... 34·4	37·1
Mean Temperature of Evaporation ..... 33·1	36·0
Mean Temperature of Dew Point ..... 30·9	33·8
Mean elastic force of Vapour ..... 0·173 in	0·221 in
Mean weight of Vapour in a cubic foot of air 2·1 gr	2·4 gr
Mean additional weight required for saturation 0·3 gr	0·4 gr
Mean degree of Humidity (saturation 1·00) .. 0·86	0·86
Mean weight of a cubic foot of air ..... 556·8 gr	544·4 gr
Fall of Rain ..... 3·137 in	4·182 in
Number of days on which Rain fell ..... 15	19·6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	9	0	0	3	8	8	1
Mean Velocity in miles per hour	9·2	3·9	0	0	6·2	12·1	9·0	13·0
Total No. of miles for each Direction	430	832	0	0	447	2331	1723	313

The total number of miles registered during the month was 6076.

The max. Velocity of the mind was 39 miles per hour. Direction S. on the 30th at 4 a.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0) .. .. . 7·0

In the month of January, the highest reading of the Barometer during 44 years, was on the 18th, in 1882, and was ..... 30·480

The lowest .. .. . 26th, 1884.... 27·803

The highest Temperature .. .. . 7th, 1887.... 59·9

The Lowest .. .. . 15th, 1881.... 4·6

The highest adopted mean temperature of the month .. .. . 1875.... 42·5

The lowest .. .. . 1881.... 29·2



The readings of the Barometer were generally high until the 20th, when a rapid fall took place, and the lower pressure lasted to the end of the month. The month was colder than usual, the mean temperature being 2°·7 below the average. The rain was less by  $\frac{1}{4}$ th of the average, and fell mostly during the latter part of the month. Snow fell on the 4th, 5th, and 16th, but hardly enough to measure; more fell on the 19th, 21st, and 22nd, but there was no heavy fall. The 26th and 31st were the only days without frost on the ground. Fog prevailed on the 3rd, 12th, 13th, and 29th.



## FEBRUARY, 1891.

Results of Observations taken during the month.		Mean for the last 44 years.
Mean Reading of the Barometer .....	29·997	29·513
Highest                    ,,                   on the 4th ....	30·286	30·063
Lowest                    ,,                   on the 26th....	29·496	28·702
Range of Barometer Readings .....	0·790	1·361
Highest Reading of a Max. Therm. on the 27th	56·0	52·0
Lowest Reading of a Min. Therm. on the 19th	25·2	22·8
Range of Thermometer Readings .....	30·8	29·2
Mean of all the Highest Readings .....	48·6	44·3
Mean of all the Lowest Readings .....	33·7	33·7
Mean Daily Range .....	14·9	10·6
Deduced Monthly Mean (from Mean of Max. and Min.) .....	40·7	38·4
Mean Temperature from dry bulb .....	39·5	38·3
Adopted Mean Temperature.....	40·1	38·3
Mean Temperature of Evaporation .....	38·4	36·9
Mean Temperature of Dew Point.....	36·2	34·7
Mean elastic force of Vapour.....	0·214in	0·193in
Mean weight of Vapour in a cubic foot of air	2·5g	2·4gr
Mean additional weight required for saturation	0·4gr	0·4gr
Mean degree of Humidity (saturation 1·00)	0·87	0·87
Mean weight of a cubic foot of air.....	556·5gr	548·8gr
Fall of Rain .....	0·614in	3·434in
Number of Days on which rain fell .....	7	17·0

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	9	0	0	1	3	13	1
Mean Velocity in miles per hour	5·1	6·7	0	0	7·0	4·3	8·6	5·1
Total No. of miles for each direction	112	1288	0	0	157	313	2696	113

The total number of miles registered during the month was 4679.  
The max. Velocity of the wind was 35 miles per hour. Direction  
W. by S. at 7 p.m. on the 11th.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				6·6
In the month of February, the highest reading of the Barometer				
during 44 years, was on the 11th, in 1849, and was . . . .				30·452
The lowest	„	„	6th, 1867. . . .	28·208
The highest Temperature	„	„	8th, 1877. . . .	58·3
The lowest	„	„	1st, 1855. . . .	10·1
The highest adopted mean temperature of the month, 1869. . . .				44·0
The lowest	„	„	1855. . . .	28·6

---

The mean reading of the barometer is the highest on record, and the range was very small ; showing that a continuously high pressure was maintained throughout the month. The rainfall was only one-fifth of the average amount, and the temperature was nearly two degrees above the average, although there were only only ten days without ground frost. Fog on the 4th and 20th.

# MARCH, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer .....	29·366	29·467
Highest                                "                               on the 3rd ..	29·901	30·081
Lowest                                "                               on the 15th ..	28·761	28·687
Range of Barometer Readings .....	1·140	1·394
Highest Reading of a Max. Therm. on the 22nd	53·2	56·8
Lowest Reading of a Min. Therm. on the 11th	20·1	22·5
Range of Thermometer Readings .....	33·1	34·3
Mean of all the Highest Readings .....	45·2	47·0
Mean of all the Lowest Readings .....	31·3	34·1
Mean Daily Range .....	13·9	12·9
Deduced Monthly Mean from Mean of Max. and Min. ....	37·5	39·7
Mean Temperature from Dry Bulb.....	38·6	39·9
Adopted Mean Temperature.....	38·1	39·8
Mean Temperature of Evaporation.....	35·7	37·9
Mean Temperature of Dew Point .....	32·5	35·3
Mean elastic force of Vapour .....	0·160in	0·205in
Mean weight of Vapour in a cubic foot of air	2·1gr	2·4gr
Mean additional weight required for saturation	0·6gr	0·5gr
Mean degree of Humidity (saturation 1·00)	0·80	0·85
Mean weight of a cubic foot of air .....	540·8gr	546·6gr
Fall of rain .....	1·926in	3·154in
Number of Days on which rain fell .....	12	17·7

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	6	6	1	1	0	8	5	4
Mean Velocity in miles per hour	8·9	8·0	3·2	10·4	0	18·9	23·3	10·1
Total No. of miles for each Direction	1284	1159	76	250	0	3620	2800	970

The total number of miles registered during the month was 10159.  
The max. Velocity of the wind was 39 miles per hour. Direction  
W. by S, on the 4th, at 3 p.m.



## APRIL, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer .....	29·566	29·477
Highest                   ,,                   on the 20th ..	29·943	29·962
Lowest                   ,,                   on the 30th ..	29·024	28·783
Range of Barometer Readings .....	0·919	1·179
Highest Reading of a Max. Therm. on the 27th	56·9	65·9
Lowest Reading of a Min. Therm. on the 17th	27·1	28·3
Range of Thermometer Readings.....	29·8	37·6
Mean of all the Highest Readings .....	50·5	55·8
Mean of all the Lowest Readings.....	34·3	37·8
Mean Daily Range .....	16·2	18·0
Deduced Monthly Mean (from Mean of Max. and Min.....)	40·9	44·3
Mean Temperature from dry bulb .....	42·2	44·4
Adopted Mean Temperature.....	41·6	44·4
Mean Temperature of Evaporation .....	38·3	41·6
Mean Temperature of Dew Point.....	34·2	38·1
Mean elastic force of Vapour.....	0·211 in	0·235 in
Mean weight of Vapour in a cubic foot of air	2·3 gr	2·7 gr
Mean additional weight required for saturation	0·8 gr	0·7 gr
Mean degree of Humidity (saturation 1·00) ..	0·76	0·80
Mean weight of a cubic foot of air .....	547·0 gr	542·0 gr
Fall of rain.....	2·116 in	2·303 in
Number of days on which Rain fell.....	11	14·7

No of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	4	13	4	2	0	3	2	2
Mean Velocity in miles per hour	79	8·7	14·8	7·1	0	3·0	15·5	5·6
Total No. of miles for each Direction	759	2707	1414	340	0	711	745	270

The total number of miles registered during the month was 6946.  
The max. Velocity of the wind was 36 miles per hour. Direction  
W.S.W. on the 16th, at 2 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)			7·6
In the month of April, the highest reading of the Barometer			
during 44 years, was on the 17th, in 1887, and was....			30·251
The lowest	„	20th, 1868....	28·358
The highest Temperature	„	14th, 1852....	74·1
The lowest	„	4th, 1885....	21·1
The highest adopted mean temperature of the month, 1865....			48·5
The lowest	„	1879....	40·7

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The character of the weather, as illustrated by rainfall, and barometric pressure is almost the reverse of that of the last month. The pressure was low during the first seven days, and the last four days, and the rain was confined to these days of low pressure, excepting the 15th, when there was a fall of ·08 inch with a high and steady barometer. The month was generally cold, with ground frost on 20 days, snow on the 2nd and 8th, and fog on the 15th.

## MAY, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer .....	29·356	29·501
Highest                   ,,                   on the 12th ..	29·850	29·937
Lowest                   ,,                   on the 1st ....	28·921	28·930
Range of Barometer Readings.....	0·929	1·007
Highest Reading of a Max. Therm. on the 12th	75·6	71·9
Lowest Reading of a Min. Therm. on the 17th	24·9	31·3
Range of Thermometer Readings .....	50·7	40·6
Mean of all the Highest Readings .....	57·8	59·6
Mean of all the Lowest Readings.....	39·9	42·1
Mean Daily Range .....	17·9	17·5
Deduced Monthly Mean (from Mean of Max. and Min. ....	47·2	49·0
Mean Temperature from dry bulb .....	47·5	49·5
Adopted Mean Temperature .....	47·4	49·3
Mean Temperature of Evaporation .....	43·6	46·0
Mean Temperature of Dew Point .....	39·4	42·5
Mean elastic force of Vapour.....	0·241 in	0·276 in
Mean weight of Vapour in a cubic foot of air	2·8 gr	2·2 gr
Mean additional weight required for saturation	1·0 gr	0·9 gr
Mean degree of Humidity (saturation 1·00)	0·75	0·76
Mean weight of a cubic foot of air .....	536·6 gr	537·0 gr
Fall of Rain .....	3·097 in	2·558 in
Number of days on which Rain fell .....	18	15·3

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	6	7	1	2	4	7	1	3
Mean Velocity in miles per hour	6·2	9·7	10·9	10·7	12·7	10·7	8·0	10·4
Total No. of miles for each Direction	894	1645	262	512	1226	1799	193	752

The total number of miles registered during the month was 7283.  
The max. Velocity of the wind was 28 miles per hour. Direction  
W. by N., on the 2nd, at 1 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)			7·3
In the month of May, the highest reading of the Barometer			
during 44 years, was on the 22nd, in 1855, and was....			30·124
The lowest	„	28th, 1877....	28·559
The highest Temperature	„	19th, 1864....	82·5
The lowest	„	4th, 1855....	23·5
The highest adopted mean temperature of the month, 1848....			55·1
The lowest	„	1855....	45·0

---

The barometer showed a changing pressure during the first half of the month, between high and low readings, and remained low from the 15th to the end of the month. A steady rise set in on the 28th, which continued through the greater part of June. The changes of temperature were considerable as shown by the great range of 10° above the average. The warmest parts of the month were from the 10th to the 14th with a high and rising barometer, and from the 27th to the 31st with a low and rising barometer. The cold period began with the 15th and lasted to the 25th; with ground frost on five days, and snow on the 16th and 17th. Hail on the 15th. Thunder on the 15th, 20th, and 23rd.



## JUNE, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer .....	29 625	29·539
Highest                   ,,                   on the 12th ..	29·977	29·886
Lowest                   ,,                   on the 29th ..	29·176	29·034
Range of Barometer Readings .....	0·801	0·852
Highest Reading of a Max. Therm. on the 19th	77·9	76·9
Lowest Reading of a Min. Therm. on the 10th	35·0	38·9
Range of Thermometer Readings .....	42·9	38·0
Mean of all the Highest Readings .....	68·0	65·7
Mean of all the Lowest Readings.....	48·3	47·9
Mean Daily Range .....	19·7	17·8
Deduced Monthly Mean (from Mean of Max. and Min.) .....	56·4	54·9
Mean Temperature from dry bulb.....	56·3	55·0
Adopted Mean Temperature.....	56·4	55·0
Mean Temperature of Evaporation.....	52·3	52·0
Mean Temperature of Dew Point .....	48·5	48·6
Mean elastic force of Vapour.....	0·343 in	0·356 in
Mean weight of Vapour in a cubic foot of air	3·9 gr	3·9 gr
Mean additional weight required for saturation	1·2 gr	0·9 gr
Mean degree of Humidity (saturation 1·00)	0·75	0·79
Mean weight of a cubic foot of air .....	531·3 gr	542·4 gr
Fall of rain .....	1·479 in	3·626 in
Number of Days on which Rain fell .....	12	16·2

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	7	9	0	1	4	7	2	0
Mean Velocity in miles per hour	8·5	12·3	0	7·9	13·5	7·2	13·4	0
Total No. of miles for each Direction	1432	2659	0	189	1297	1216	641	0

The total number of miles registered during the month was 7434  
The max. Velocity of the wind was steady at 25 miles per hour,  
from noon to 3 p.m., on the 3rd. Direction N.E. by E. at noon,  
E.N.E. at 1, 2, and 3 p.m.

---

loud (an overcast sky being indicated by 10·0)	7·0
une, the highest reading of the Barometer	
rs, was on the 15th, in 1874, and was....	30·219
„ „ 12th, 1862....	28·632
perature „ 27th, 1878....	87·2
„ „ 30th, 1856....	84·2
ed mean temperature of the month, 1858....	59·0
„ „ 1856 and 1860	52·2

---

rise of the barometer, which began on the 28th of  
rued with small variations to the 12th. The  
ed generally high from 11th to the 24th,  
he annual mean on all the days except the 2nd,  
four days of the month. The rainfall was less  
age amount.

halo was seen on the 9th, with the colours very  
other, but less coloured on the 19th; and both  
fine sunny weather.  
he 24th and 25th.

## JULY, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer .....	29·481	29·501
Highest                    "                   on the 14th ..	29·917	29·876
Lowest                    "                   on the 7th....	28·996	28·993
Range of Barometer Readings .....	0·921	0·883
Highest Reading of a Max. Therm. on the 17th	77·1	78·8
Lowest Reading of a Min. Therm. on the 31st	44·1	42·0
Range of Thermometer Readings.....	33·0	36·8
Mean of all the Highest Readings .....	67·0	67·8
Mean of all the Lowest Readings.....	50·3	50·7
Mean Daily Range .....	16·7	17·1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	56·8	57·7
Mean Temperature from dry bulb .....	56·9	57·8
Adopted Mean Temperature .....	56·9	57·8
Mean Temperature of Evaporation.....	53·6	54·8
Mean Temperature of Dew Point .....	50·5	52·2
Mean elastic force of Vapour .....	0·368in	0·390in
Mean weight of Vapour in a cubic foot of air	4·1 gr	4·5gr
Mean additional weight required for saturation	1·1 gr	1·0gr
Mean degree of Humidity (saturation 1·00) ..	0·79	0·82
Mean weight of a cubic foot of air .....	528·1 gr	527·3gr
Fall of Rain .....	3·143in	4·257in
Number of days on which Rain fell.....	18	18·2

No. of days in the month of which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	0	0	1	4	16	5	3
Mean Velocity in miles per hour	6·3	0	0	9·0	8·0	9·5	13·0	9·0
Total No. of miles for each Direction	304	0	0	216	759	3664	1561	641

The total number of miles registered during the month was 7145.  
The max. Velocity of the wind was 25 miles per hour. Direction W. by S., on the 27th, at 2 p.m., and the same velocity, direction W.S.W., on the 28th, at 4 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0			8·2
In the month of July, the highest reading of the Barometer			
during 44 years, was on the 24th, in 1868, and was....			30·112
The lowest	„	15th, 1877....	28·564
The highest Temperature	„	22nd, 1873....	88·2
The lowest	„	1st, 1857....	36·0
The highest adopted mean temperature of the month, 1852....			63·0
The lowest	„	1888....	54·5

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The barometer was generally unsteady throughout the month, and represented a series of short atmospheric waves. The rainfall was less by one-quarter of the average amount. Thunder on the 6th, 8th, 17th, 21st, and 30th.

## AUGUST, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer .....	29·309	29·487
Highest                   ,,                   on the 7th ..	29·668	29·885
Lowest                   ,,                   on the 26th..	28·592	28·950
Range of Barometer Readings .....	1·076	0·935
Highest Reading of a Max. Therm. on the 18th	69·2	77·0
Lowest Reading of a Min. Therm. on the 29th	40·8	41·4
Range of Thermometer Readings.....	28·4	35·6
Mean of all the Highest Readings .....	64·2	67·1
Mean of all the Lowest Readings.....	49·9	50·4
Mean Daily Range .....	14·3	16·7
Deduced Monthly Mean (from Mean of Max. and Min.) .....	55·4	57·1
Mean Temperature from dry bulb .....	55·7	57·5
Adopted Mean Temperature.....	55·6	57·3
Mean Temperature of Evaporation.....	53·2	54·5
Mean Temperature of Dew Point.....	51·0	51·8
Mean elastic force of Vapour.....	0·375 in	0·388 in
Mean weight of Vapour in a cubic foot of air	4·2 gr	4·8 gr
Mean additional weight required for saturation	0·8 gr	0·9 gr
Mean degree of Humidity (saturation 1·00)..	0·85	0·82
Mean weight of a cubic foot of air.....	526·3 gr	525·1 gr
Fall of Rain .....	9·869 in	4·922 in
Number of days on which Rain fell.....	27	19·0

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	0	0	2	4	17	3	2

Mean Velocity in miles per hour	7·2	0	0	10·6	11·9	10·9	9·9	4·2
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Total No. of miles for each Direction.	518	0	0	507	1118	4466	713	201
---	-----	---	---	-----	------	------	-----	-----

The total number of miles registered during the month was 7523.  
The max. Velocity of the wind was 42 miles per hour. Direction  
S.W., on the 26th, at 6 a.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				9·0
In the month of August, the highest reading of the Barometer				
during 44 years, was on the 21st, in 1874, and was....				30·114
The lowest	„	„	31st, 1876....	28·555
The highest Temperature	„	„	2nd, 1868....	88·0
The lowest	„	„	13th, 1887....	33·4
The highest adopted mean temperature of the month, 1857 & '84				61·0
The lowest	„	„	1848....	52·5

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The Barometer was very unsteady throughout the month, and generally low. The rainfall was quite double the average, and is the greatest recorded fall for August. There were only four rainless days; the 6th and 16th with a comparatively high and rising barometer, the 18th with a low and falling barometer, and the 22nd with a low rising barometer. The heaviest rain was 1·8 inch on the 13th, with a comparatively high barometer. Thunder on the 2nd, 4th, 10th, 21st, 28th, and 29th.

# SEPTEMBER, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer.....	29·498	29·516
Highest                   ,,                   on the 16th..	29·823	30·028
Lowest                   ,,                   on the 1st ..	28·747	28·845
Range of Barometer Readings.....	1·076	1·183
Highest Reading of a Max. Therm. on the 10th	79 1	72·5
Lowest Reading of a Min. Therm. on the 2nd	42·2	36·5
Range of Thermometer Readings .....	36·9	36 0
Mean of all the Highest Readings .....	63·8	62·2
Mean of all the Lowest Readings .....	49·8	47·1
Mean Daily Range .....	14·0	15 1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	55·5	53·4
Mean Temperature from dry bulb .....	56·2	54·1
Adopted Mean Temperature.....	55·9	53·8
Mean Temperature of Evaporation.....	52·1	51·0
Mean Temperature of Dew Point .....	48·5	48·4
Mean elastic force of Vapour .....	0·344in	0·340in
Mean weight of Vapour in a cubic foot of air	3·8gr	4·0gr
Mean additional weight required for saturation	1·2gr	0·8gr
Mean degree of Humidity (saturation 1·00)	0·77	0·82
Mean weight of a cubic foot of air .....	529·5gr	532·4gr
Fall of Rain .....	5·003in	4·608in
Number of days on which Rain fell.....	19	18·0

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	6	0	0	5	10	7	1

Mean Velocity in miles per hour	10·4	5·2	0	0	9·6	14·0	10·5	17·3
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Total No. of miles for each Direction	250	748	0	0	1157	3364	1766	415
--	-----	-----	---	---	------	------	------	-----

The total number of miles registered during the month was 7700.  
The max. Velocity of the wind was 43 miles per hour, Direction  
S.W., on the 1st at 8 p.m.

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of Cloud (an overcast sky being indicated by 10·0)	7
of September, the highest reading of the Bar-	
ring 44 years, was on the 15th, in 1851, and was	30·27
"                    "            2nd, 1883....	28·32
Temperature                    "            6th, 1868....	85
"                    "            25th, 1885, and	
30th, 1888..	29
adopted mean temperature of the month, 1865	59
"                    "            1863	50

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meter showed a steady rise from its lowest reading on the 11th, with the exception of a sudden dip between the 13th and 14th, and was very unsteady throughout the rest of the month. The rainfall was a little above the average and the



## OCTOBER, 1891.

## Results of Observations taken during the Month.

Mean for the  
last  
44 years

Mean Reading of the Barometer.....	29 270	29 425
Highest                   ,,                   on the 31st..	30 286	30 014
Lowest                   ,,                   on the 13th..	28 242	28 648
Range of Barometer Readings.....	2 044	1 366
Highest Reading of a Max. Therm. on the 9th	62 8	64 3
Lowest Reading of a Min. Therm. on the 24th	29 8	29 3
Range of Thermometer Readings .....	33 0	35 0
Mean of all the Highest Readings .....	55 7	54 5
Mean of all the Lowest Readings .....	41 2	41 8
Mean Daily Range .....	14 5	12 7
Deduced Monthly Mean (from Mean of Max. and Min. ....	47 5	47 2
Mean Temperature from dry bulb .....	47 7	47 8
Adopted Mean Temperature.....	47 6	47 6
Mean Temperature of Evaporation.....	45 1	45 3
Mean Temperature of Dew Point .....	42 4	42 9
Mean elastic force of Vapour .....	0 270 in	0 276 in
Mean weight of Vapour in a cubic foot of air	3 1 gr	2 9 gr
Mean additional weight required for saturation	0 7 gr	0 6 gr
Mean degree of Humidity (saturation 1 00)	0 83	0 84
Mean weight of a cubic foot of air .....	534 6 gr	540 4 gr
Fall of Rain .....	3 900 in	5 014 in
Number of days on which Rain fell .....	20	21 9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	6	1	2	9	9	3	0
Mean Velocity in miles per hour	3 9	8 2	11 1	17 7	17 2	11 3	11 1	0
Total No. of miles for each Direction	93	1187	286	851	3711	2450	796	0

The total number of miles registered during the month was 9374.  
The max. Velocity of the wind was 51 miles per hour ; direction  
S.S.E. on the 13th at 5 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0				9·0
In the month of November, the highest reading of the Barometer				
during 44 years, was on the 12th, in 1857, and was....				30·350
The lowest	„	„	11th, 1891....	27·938
The highest Temperature	„	„	6th, 1872....	61·9
The lowest	„	„	17th, 1861....	19·1
The highest adopted mean temperature of the month, 1881				47·0
The lowest	„	„	1851....	36·7

The high barometric pressure reached at the end of last month, was maintained through the first week, with small variations not falling below 30 inches. But the decline began on the 5th, and the mercury stood at 29·0 at 9 a.m. on the 9th, having fallen one inch in two days. It then halted for over 30 hours, with a gentle rise before the storm of the 11th. The following table shows the atmospheric disturbance before and during the gale.

		Barometer	Wind
Nov. 9	9 p.m.	28·92	light S.W. steady
„ 10	9 a.m.	29·06	„ „
„	11 a.m.	29·11	„ backing at 3 p.m.
„	4 p.m.	29·06	„ S. backing
„	9 p.m.	28·90	„ E.S.E. backing
„	11 p.m.		fresh g E.
„	1 p.m.		steady half gale from E. till 6 a.m.
„ 11	9 a.m.	28·05	falling E. backing at 11 a.m.
„	1 p.m.	27·94	light N.E. backing
„	2 p.m.		gale W.N.W. slowly backing
„ 12	9 a.m.	28·91	breeze S.S.W. 11 a.m. calm

The gale opened suddenly and synchronously with the beginning of a very rapid rise of the barometer, and held on, slowly falling and slowly backing to a S.W. fresh breeze at 2 a.m. of the 12th.

## DECEMBER, 1891.

Results of Observations taken during the Month.		Mean for the last 44 years.
Mean Reading of the Barometer .....	29·431	29·458
Highest                    "                   on the 21st..	30·218	30·071
Lowest                    "                   on the 10th..	28·387	28·599
Range of Barometer Readings.....	1·851	1·472
Highest Reading of a Max. Therm. on the 3rd	57·0	53·0
Lowest Reading of a Min. Therm. on the 24th	14·0	20·2
Range of Thermometer Readings .....	43·0	32·8
Mean of all the Highest Readings .....	44·5	42·9
Mean of all the Lowest Readings .....	31·8	32·9
Mean Daily Range .....	12·7	10 0
Deduced Monthly Mean (from Mean of Max. and Min.) .....	38·2	37·9
Mean Temperature from dry bulb.....	38 2	38·6
Adopted Mean Temperature.....	38·2	38·3
Mean Temperature of Evaporation .....	36·9	36·7
Mean Temperature of Dew Point .....	35·1	34·9
Mean elastic force of Vapour .....	0·240 in	0·205 in
Mean weight of Vapour in a cubic foot of air	2·4 gr	2·4 gr
Mean additional weight required for saturation	0·4 gr	0·4 gr
Mean degree of Humidity (saturation 1·00)	0·89	0·87
Mean weight of a cubic foot of air .....	547·9 gr	540·6 gr
Fall of Rain .....	8·712 in	5·299 in
Number of days on which Rain fell.....	20	9·2

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	4	1	1	0	5	10	7	1
Mean Velocity in miles per hour	2·6	2·3	16·0	0	14·2	15·0	14·7	0·3
Total No. of miles for each Direction.	267	55	373	0	1701	3602	2562	8

The total number of miles registered during the month was 8568.  
The max. Velocity of the wind was 46 miles per hour. Direction  
W. at midnight on the 11th. Calm on the 24th and 25th.

Mean amount of Cloud (an overcast sky being indicated by 10·0				6·6
In the month of December, the highest reading of the Bar-				
ometer during 44 years, was on the 22nd in 1849, and was				30·378
The lowest	„	„	8th, 1886....	27·350
The highest Temperature	„	„	9th, 1876....	58·1
The lowest	„	„	24th, 1860....	6·7
The highest adopted mean temperature of the month, 1857				44·6
The lowest	„	„	1878....	30·3

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The barometer was very unsteady between 6th and 14th, changing half an inch daily. An extra depression began on the 9th, accompanied with rough and wet weather. It reached the lowest reading of the month at 9 p.m. of the 11th, and the wind freshened to a gale, which registered its maximum velocity of 48 miles per hour between 1 and 2 a.m., while the mercury was making its most rapid rise. A sudden shift of the wind during the breeze of the 9th and 10th from S.W. to N.W. was coincident with a rise of the barometer of 0·06 inch in about 6 minutes at 4-20 a.m. The rainfall was great, and was over half-an-inch on the 5th, 9th, 12th, 13th, 15th, 28th and 30th.

## Summary of Observations

### FOR 1891.

	Mean for the last 44 years
Mean Reading of the Barometer ... ..29·513	29·487
Highest                   ,,           on January 14th...30·299	30·279
Lowest                   ,,           on November 11th...27·938	28·261
Range of Barometer Readings..... .. 2·361	2·018
Highest Reading of a Max. Therm. on Sep. 10th 79·1	81·4
Lowest Reading of a Min. Therm. on Jan. 17th 11·0	15·6
Range of Thermometer Readings..... 68·1	65·8
Mean of all the Highest Readings..... 54·4	54·7
Mean of all the Lowest Readings..... 39·6	40·7
Mean Daily Range ..... 14·8	14·0
Deduced yearly Mean (from Mean of Max & Min) 46·0	46·8
Mean Temperature of dry bulb..... 46·2	46·7
Adopted Mean Temperature..... 46·1	46·8
Mean Temperature of Evaporation..... 43·6	44·5
Mean Temperature of Dew Point..... 40·6	42·2
Mean elastic force of Vapour..... 0·264 in	0·273 in
Mean weight of Vapour in a cubit foot of air 3·0 gr	3·3 gr
Mean additional weight required for saturation 0·7 gr	0·7 gr
Mean degree of Humidity (saturation 1·00)... 0·82	0·84
Mean weight of a cubit foot of air..... 539·9 grs	539·6 grs
Total fall of rain in the Year .....48·506 in	47·154 in
Number of days per Month on which Rain fell 16·4	18·1

The Maximum monthly mean height of the Barometer was in  
February, 1891, and was ..... 29·997

The Minimum   ,,   ,,   in December, 1868, and was... 28·984

The Maximum yearly mean height of the Barometer was in  
1887, and was ..... 29·582

The Minimum   ,,   ,,   in 1866, and was..... 29·389

The greatest monthly range of the Barometer was in  
January, 1884, and was ..... 2·409  
The least           ,,           ,,           in July, 1852, and was..... 0·505  
The highest reading of the Barometer, during 44 years, was  
on January 18th, 1882, and was .....30·480  
The lowest           ,,           ,,           on December 8th, 1886, and was27·350  
Extreme range ..... 3·130  
The highest temperature was on July 15th, 1868, and was .. 88·2  
The lowest           ,,           ,,           January 15th, 1881.. 4·6  
The highest adopted mean temperature of a month, July, 1868 62·4  
The lowest           ,,           ,,           February, 1855.. 28·6  
The highest adopted mean temperature of a year, 1868.. 49·1  
The lowest           ,,           ,,           ,,           ,,           1879.. 44·1  
The greatest monthly mean weight of vapour, }  
in a cubic foot of air ..... } July, 1852.. 5·1  
The least           ,,           ,,           ,,           February, 1855.. 1·4  
The greatest fall of rain in a month, was in October, 1870, and  
was .....13·437in  
The least           ,,           ,,           ,,           March, 1852... 0·047  
The greatest number of days on }  
which rain fell in one month } July, 1861, Dec. 1868 31  
The least           ,,           ,,           ,,           March, 1852... 3

No. of days in the year on which the prevailing wind was .....	N	NE	E	SE	S	SW	W	NW
	42	73	11	12	45	102	59	19
Mean Velocity in miles per hour .....	6·7	7·7	13·3	11·4	12·2	11·7	11·7	8·1
Total No. of miles for each Direction.....	6719	13454	3501	3287	13185	28556	16548	3702

The total No. of miles registered during the year was 88·952.  
The max. Velocity of the wind was 51 miles per hour ; direction S.S.E., at 5 p.m., on October 13th.

# DATES OF OCCASIONAL PHENOMENA.

1891.	Frost	Hoar Frost	Snow	Hail
January	1—26, 27—31	6	4, 5, 16, 19, 21, 22	4, 21, 22
February	1—3, 9, 12, 13, 15—30	18, 19, 25—27		
March	3, 7—24, 26, 27, 29—31	30, 31	3, 8, 14, 15, 26, 27	2, 8, 23, 26, 27
April	1, 2, 7, 8, 11—15, 17—30	17	2, 8	
May	16—21, 22		16, 17	15
June	11			
July				
August				
September				2
October	24, 25, 27, 29—31	23, 28, 29		14, 17
November	10, 14, 18, 22—30	22, 29	26	9, 26
December	8, 12, 15—29	16, 19, 20, 24	11, 12	11, 29, 31

# DATES OF OCCASIONAL PHENOMENA.

(Continued).

1891.	Heavy Rain	Fog	Thunder	Lightning	Lunar Halo	Solar Halo
January	24	3, 12, 13, 29				
February		4, 20	26			
March						
April	29	15	15, 20, 23			
May			24, 25	24		9, 19
June			6, 8, 17, 21			
July	6, 21		4, 10, 21, 23, 29	2	23	
August	2, 8, 13, 24, 25, 27					
September	5, 19					
October	14, 18		12, 14	17	15	
November		24, 26, 27			13, 14, 17	
December	5, 9, 12, 13, 15, 28, 30	15, 23, 24, 25	27	27	14	

A Lunar Rainbow was seen at 7-0 p.m. on November 17th.

Aurora Borealis was seen at 10-30 p.m. on March 16th.

" " " 8-30 p.m. on November 21st.



# SUMMARY OF SOLAR OBSERVATIONS.

Number of days of Observation in Each Month.

1891	Recorded Sunshine.	Amount of Sunshine expressed in hours.	Number of Sun Drawings, 10½ inches to diameter.	Other Drawings and Notes.	Entire Chromosphere Measured,	Chromosphere partially measured.	Spot spectra observed.
January	16	51.1	7	6	1		
February	19	73.7	8	5	5		
March ..	23	92.7	5	8			
April .....	25	101.4	5	3	1		
May .....	27	159.3	12	1	3		
June .....	27	189.0	16		6		
July .....	30	149.9	13		4		
August ..	24	88.4	8		2		2
Septemb'r	27	128.5	17		7	1	6
October	28	111.4	17		7		
Novemb'r	15	18.5	8			1	
Decemb'r	16	23.4	9		2		
Totals ..	277	1187.3	125	23	38	2	8

# DATES OF SOLAR DRAWINGS, OF NOTES, OF OBSERVATIONS OF CHROMOSPHERE, AND OF SPOT SPECTRA.

The figures express, in hundredths of a day, the Greenwich Civil time at which the drawing was made.  
*c* denotes chromosphere, *s* spot spectra.

1891	January.	February.	March.	April.	July.	August.	Septem.	Novem.	Decem.
1									
2	42	.50,c			39	.70	.68,c		.58
3							.35,c,s		
4					43,c		.41,c,s		
5	40				50		<sup>s</sup>		
6							.42,c,s		
7					.78		84		
8					.48		.45		
9			40		71		42		.38
10				.56			48		
11						.76	40,c		
12		59					.45		
13					.72		38		
14					.65		.43,c		.59
15		.49,c					.74		.45,c
16					.72		.64		
17	.55								
18	.58	.60,c			.66				
19		.56				.33,c,s			
20									
21	.60	.62		44		.66			.47
22			50						.46,c
23		.60		.36			.33,s		.50
24					72				
25		.61,c			59				
26				36		.53			
27	.56			44	.64,c				
28						.75	.40,c,s		.45,c
29			73			.70	.68		48
30			49			.67		.46	

# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January.....	0	1.5	0	0.6	5.4	2.8	2.2	0	0	0	0	0	4.0	5.0	0.6	0	5.0
February.....	6.6	0	0	0	0.3	0	0	0	2.0	0	0.6	5.1	1.0	0	7.1	1.0	0
March.....	0	4.5	4.0	0	0	0	2.2	4.0	6.1	1.3	7.7	7.9	2.4	0	0	0	0.6
April.....	4.2	0	2.7	0	0.1	0	3.7	0	4.4	2.5	4.2	2.2	4.0	4.6	4.1	5.0	11.8
May.....	0.5	9.9	1.1	13.3	0	8.4	4.6	5.6	0	2.7	7.3	14.0	9.2	5.2	2.8	6.9	7.9
June.....	13.1	0	6.0	0.1	2.1	7.3	0.2	8.2	7.2	13.0	15.0	12.5	3.5	2.8	4.9	9.2	0
July.....	4.6	6.2	11.3	13.0	0.8	4.5	1.5	8.5	3.9	7.7	0	0.1	6.6	6.9	3.2	2.7	10.5
August.....	0	9.3	2.0	4.1	0.8	5.5	0.7	0.1	1.2	5.6	0	5.0	3.7	0	5.3	2.1	2.0
September.....	3.5	5.6	8.5	6.7	0.9	3.9	10.1	0.3	7.9	11.1	7.2	10.0	9.1	2.3	4.9	0	0
October.....	0	4.6	3.0	6.1	1.6	0	5.1	5.9	4.4	0	0.7	4.1	0.1	2.5	1.4	4.6	3.1
November.....	0.2	1.1	0	0.1	0	0	0	0	0.6	0.5	0	2.2	0	0	0	0	1.8
December.....	0	1.1	0	1.1	0	1.6	0	1.4	0.9	0	0.7	0	0	3.0	0	0.4	1.4

# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY: (Continued.)

MONTH.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Per centage each month.
January.....	4.2	0	0	4.0	3.0	0	0	2.5	0	3.3	0	0	2.4	4.6	51.1	19.7
February.....	4.9	4.9	4.4	2.4	0.9	6.3	3.9	7.1	6.5	6.7	2.0	0	0	0	73.7	26.5
March .....	4.8	0.5	5.8	1.6	4.5	0	1.7	3.2	4.0	5.3	2.9	6.8	5.8	5.1	92.7	25.3
April .....	2.9	6.0	3.9	0.4	6.2	11.6	3.0	0.7	4.0	1.7	6.9	0	0.6	0	101.4	24.4
May .....	9.5	5.2	2.9	1.5	0	6.9	3.2	0.9	0	2.0	0.5	8.4	8.9	10.0	159.3	33.1
June .....	1.4	9.0	14.1	15.2	8.3	9.7	5.5	0.5	4.6	2.8	0	6.3	6.5	0	189.0	38.3
July.....	3.4	4.1	1.9	0.5	1.5	4.8	5.0	4.9	8.4	9.2	6.6	5.2	1.2	1.2	149.9	30.2
August.....	9.8	7.1	1.7	3.1	0	1.9	1.0	0	2.0	0	5.7	2.9	5.8	0	88.4	19.5
September.....	5.0	1.2	0	0.1	0.5	4.4	2.1	3.2	4.2	5.7	6.5	0.6	3.0	0	128.5	34.1
October .....	2.2	2.8	6.1	4.4	0.4	0.4	7.3	5.5	2.5	7.9	7.7	7.8	3.0	6.2	111.4	33.8
November.....	0	1.3	0.2	2.8	2.3	0.7	0	0.5	0.2	0	0	4.0	0	0	18.5	7.0
December .....	0	0	1.7	4.7	0.4	0.4	0	0	0	2.5	1.5	0	0	0.6	23.4	9.7

MONTHLY TABLES FOR EACH HOUR OF RECORDED SUNSHINE.

Local apparent time.	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9
January.....: .....	0	0	0	0	0.7	7.4	8.8	10.1	9.3	8.2	5.9	0.7	0	0	0	0	0
February.....	0	0	0	0.2	5.1	10.6	11.7	12.0	12.0	10.5	7.4	4.0	0.2	0	0	0	0
March.....	0	0	1.5	6.6	9.6	11.7	12.8	13.5	11.2	7.9	8.0	6.2	2.5	1.2	0	0	0
April .....	0	0.7	4.6	10.1	14.1	12.6	12.2	7.3	6.1	5.4	7.3	6.7	8.5	4.6	1.8	0	0
May.....	0.3	3.9	9.2	10.0	13.0	13.2	12.9	14.3	14.4	15.1	12.9	13.5	11.9	7.2	6.4	1.1	0
June.....,.....	2.7	9.0	13.2	12.9	12.1	12.3	12.1	13.2	11.1	14.1	14.6	15.5	15.3	13.5	12.6	4.8	0
July.....	0.3	4.3	6.5	7.8	9.5	6.8	10.1	12.7	12.7	12.5	12.6	15.0	13.9	12.9	10.3	2.0	0
August.....	0	0.4	3.8	5.0	5.5	7.5	7.8	7.7	7.8	8.6	6.7	9.3	9.6	7.0	1.7	0	0
September.....	0	0	1.1	7.2	10.9	11.9	12.7	13.9	16.4	14.2	12.2	12.9	12.2	2.9	0	0	0
October.....	0	0	0	0.5	7.6	12.5	14.7	16.9	18.8	17.2	12.3	8.7	2.2	0	0	0	0
November.....	0	0	0	0	0	0.2	1.6	2.9	4.2	5.2	4.0	0.6	0	0	0	0	0
December.....	0	0	0	0	0	0.7	3.6	6.9	5.4	5.4	1.4	0	0	0	0	0	0
Total.....	3.3	18.3	39.9	60.3	88.1	107.4	121.0	131.4	129.4	124.3	105.3	93.1	76.3	49.3	32.8	7.9	0

## OBSERVATIONS OF UPPER CLOUDS (CIRRUS).

Date. 1891.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	Velocity (0—6).	Direction.	Force. (0—12).	
January 2	Noon.	N.E.	2	N.E.	1	N.E.
" 2	1 p.m.	N.N.E.	1	N.E.	1	N.E.
Feb. 12	Noon.	W.N.W.	1	S.E. by E.	0	W. by N.
" 12	2 p.m.	N.W.	2	W.	1	W.
" 15	9-30 a.m.	S.S.E.	1	N.W.	1	N.W.
" 26	9 a.m.	W.S.W.	1	N.E. by N.	1	
March 9	11 a.m.	E.N.E.	3	N.E. by E.	2	N. by E.
" 9	Noon.	N.E.	2	E.N.E.	3	N.E.
" 25	9 a.m.	S.W.	3	W. by S.	5	S.W.
" 28	Noon.	N.W.	1	N.W. by N.	2	N. by W.
April 13	9-15 a.m.	E. by S.	1	E.	1	E.
" 15	5-15 p.m.	N. by W.	2	W. by S.	3	
" 16	2 p.m.	W.S.W.	3	W.S.W.	7	W.
" 16	4-20 p.m.	W.N.W.	2	W. by S.	5	W.
" 16	5-25 p.m.	N.W.	3	W. by S.	5	W.
" 17	3 p.m.	W.N.W.	2	W. by S.	3	N.W.
" 17	5 p.m.	N.W.	1	W. by N.	3	N.
" 28	1-30 p.m.	N.W.	3	W. by S.	4	W.
" 28	4-15 p.m.	N.W. by W.	3	W.	4	W.
" 28	5 p.m.	N.W.	2	W. by S.	4	
May 11	5 p.m.	N.N.E.	1	N.E.	3	N.E.
" 12	2-15 p.m.	W. by S.	1	W.S.W.	2	N.E.
" 12	5-30 p.m.			S.W. by W.	2	
" 12	7-30 p.m.	W.N.W.	1	S.W. by S.	1	
" 13	8 a.m.	W.S.W.	2	S.S.W.	2	S.W.
" 13	11 a.m.	W.N.W.	2	W.S.W.	3	N.W.
" 30	9-20 a.m.	S.W. by S.	1	S.	1	S. by W.
" 30	10 a.m.	S.	1	S.	1	S.W. by S.
" 30	Noon.	S. by W.	1	S. by W.	2	S.S.W.
" 31	2 p.m.	E.N.E.	2	E.	3	E.
" 31	4 p.m.	N.E.	1	S.E.	4	E.
June 1	9 a.m.	S. by E.	1	N.E. by N.	1	
" 1	11 a.m.	S.	1	E.N.E.	3	
" 1	Noon.	N.E.	2	E.N.E.	4	E. by N.
" 3	2-45 p.m.	N.E.	2	E.N.E.	5	E.N.E.
" 3	4 p.m.	E. by S.	2	N.E. by E.	4	
" 6	8 a.m.	W.	2	N.E. by N.	3	N.E.
" 8	4 p.m.	N.N.E.	2	N.E. by E.	4	
" 8	5 p.m.	N.N.E.	1	E.N.E.	4	N.E.

OBSERVATIONS OF UPPER CLOUDS (*Continued*).

Date. 1891.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds
		Direction.	Velocity (0—6)	Direction.	Force (0—12)	
June 9	11-30 a.m.	N. E.	1	N. E.	1	N. N. E.
" 11	Noon.	N. by E.	1	S.	1	
" 11	3 p.m.	W. by N.	1	S. W. by W.	2	
" 16	3-30 p.m.	W.	2	S. W. by W.	3	W. by N.
" 21	Noon.	N. N. E.	2	N. E. by E.	2	
" 21	1 p.m.	N. N. E.	2	N. E. by E.	1	
" 26	11-30 a.m.	S.	1	S. E. by S.	2	S.
July 3	2 p.m.	S. S. W.	1	S. W.	2	S. W.
" 10	5-30 p.m.	W. by S.	1	S. W.	2	W.
" 10	7 p.m.	W. S. W.	1	S. S. E.	2	W.
" 14	7 p.m.	E. N. E.	1	N. E. by N.	3	N. E.
" 14	8 p.m.	N. E.	1	N. N. E.	1	
" 23	6 p.m.	W. by N.	2	W. by S.	3	W.
" 24	Noon.	W. N. W.	3	S. W. by W.	4	W.
" 27	11 a.m.	S. W.	1	W.	3	W. N. W.
" 27	12-30 a.m.	W. S. W.	1	W.	4	W. N. W.
" 27	4-30 p.m.	W. by S.	1	W. by S.	4	N. W.
" 27	5 p.m.	S. W.	1	W.	4	N. W.
August 6	3 p.m.	N. N. W.	1	W. S. W.	3	W.
" 6	4 p.m.	N.	2	W. S. W.	3	W. by N.
" 6	5-30 p.m.	N. E.	2	W. S. W.	3	W.
" 13	9 a.m.	S. W. by W.	1	W.	3	W.
" 19	9 a.m.	S. by W.	1	S. S. E.	3	S.
" 22	8 p.m.	N.	2	N. by E.	1	E.
" 26	Noon.	S. W.	3	S. W. by W.	4	SW by W
" 26	2 p.m.	S. W.	2	S. W. by W.	3	W. S. W.
" 26	4-30 p.m.	S. W.	2	S. W.	2	S. W.
" 30	10 a.m.	W.	2	S. S. E.	1	S. S. W.
Sept. 3	9-30 a.m.	S. W.	1	S. S. W.	1	S. W. by S.
" 3	Noon.	S. S. W.	1	S.	2	S. W.
" 3	4 p.m.	S. S. W.	2	S. E.	1	
" 7	4 p.m.	W. S. W.	2	W. S. W.	1	
" 7	5 p.m.	W. S. W.	1	W. by S.	0	
" 9	10 a.m.	S. by W.	1	S. by E.	2	
" 9	2 p.m.	S. S. W.	2	S. by E.	3	S. S. W.
" 11	9 a.m.	N. N. E.	1	N. N. E.	0	
October 4	10 a.m.	W. S. W.	1	S. by W.	3	S. W.
" 4	11 a.m.	W. S. W.	2	S. S. W.	3	S. S. W.
" 8	7-30 a.m.	S. W.	1	S. W.	0	
" 8	2 p.m.	S. W.	2	S. by W.	3	S. by W.

OBSERVATIONS OF UPPER CLOUDS (*Continued*).

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Date 1891	G.M.T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	Velocity (0—6)	Direction.	Force. (0—12).	
October 9	9 a.m.	S.W. by S.	2	S.W.	3	S.W.
„ 19	3 p.m.	W. by S.	3	W. by S.	2	S.W.
Nov. 21	Noon.	W.	2	N.	1	N. by W.
„ 29	10-5 a.m.	S.	2	W.S.W.	1	SW by W
Dec. 14	Noon.	N.N.W.	3	W. by N.	2	NW by W
„ 28	2 p.m.	N. by W.	4	S.W. by W.	1	W.S.W.



# MONTHLY MAGNETICAL OBSERVATIONS

## TAKEN AT THE

### COLLEGE OBSERVATORY, STONYHURST, 1891.

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THE Horizontal, Vertical, and Total Forces are calculated to English measure; one foot, one second of mean solar time, and one grain being assumed as the units of space, of time, and of mass.

The Vertical and Total Forces are obtained from the absolute measures of the Horizontal Force and of the Dip

In the observations of Deflection and Vibration, taken each month for absolute measure of Horizontal Force, the same magnet has always been employed.

The moment of inertia of the magnet with its stirrup, for different degrees of temperature, and the co-efficients in the corrections required for the effects of temperature and of terrestrial magnetic induction on the magnetic moment of the magnet, were determined at the Kew Observatory by the late Mr. Welsh.

The moment of inertia of the magnet with its stirrup, using the grain and foot as the units of mass and of linear measure is 5·27303. Its rate of increase for increase of temperature is 0·00073 for every 10° of Fahr.

The weight of the magnet with its stirrup is approximately 825 grains, and the length of the magnet is nearly 3·94 inches. The moment of inertia was determined, independently of the weight and dimensions, by the method of vibration, with and without a known increase of the moment of inertia.

The temperature corrections have always been obtained from the formula  $q(t^\circ - 35^\circ) + q'(t^\circ - 35^\circ)^2$ , where  $t^\circ$  is the observed temperature and  $35^\circ$  Fahr. the adopted standard temperature. The values of the co-efficients  $q$  and  $q'$  are respectively 0·0001128 and 0·000000436.

The induction co-efficient  $\mu$  is 0·000244.

The correction for error of graduation of the Deflection bar at 1·0 foot is  $+ 0\cdot00004$  ft, at 1·3  $+ 0\cdot000064$  ft.

The observed times of vibration are entered in the Table without corrections.

The time of one vibration has been obtained each month from the mean of twelve determinations of the time of 200 vibrations.

The angles of deflection are each the mean of two sets or readings.

In deducing from these observations the ratio and product of the magnetic moment  $m$  of the magnet, and the earth's horizontal magnetic intensity  $X$ , the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread ; but no correction has been required for the rate of the chronometer, or for the arc of vibration, the former having been always under 1·5s and the latter never over 50'.

The average deflection of the magnet caused by a twist of the torsion circle through  $90^\circ$ , has been about  $15'\cdot5$  of arc.

In the calculations of the ratio  $\frac{m}{X}$ , the third and subsequent terms of the series  $1 + \frac{P}{r^2} + \frac{Q}{r^4} + \&c.$ , have always been omitted.

The value of the constant  $P$  was found to be  $0\cdot00564$ .

The Declination observations have been taken once a week.

OBSERVATIONS OF VIBRATIONS AND DEFLECTION  
FOR ABSOLUTE MEASURE OF MAGNETIC FORCE.

Month.	G. M. T. (Civil Day).	Temper- ature.	Time of one vibration.	G. M. T.	Tem- pera- ture.	Observed Deflection at 1·0 ft. at 1·3 ft.
	D. H. M.	°		D. H. M.	°	° ' "
January	15th 12 35	39·0	5·84500	15th 13 27	43·0	12 38 27
February	26th 10 47	47·5	5·85600	26th 11 55	50·5	12 36 48
				„ 12 17	50·9	5 43 30
March ..	28th 18 41	48·0	5·85750	27th 14 17	45·0	12 38 43
				„ 14 30	46·0	5 43 44
April ....	23rd 10 57	49·0	5·86442	23rd 11 42	50·0	12 39 12
				„ 11 56	51·0	5 43 36
May ....	28th 10 30	49·5	5·90890	28th 11 42	57·0	12 33 20
				„ 11 53	58·0	5 43 11
June ....	11th 13 59	64·0	5·83830	11th 14 36	64·0	12 35 37
				„ 14 50	65·0	5 41 55
July ....	15th 11 13	66·0	5·90977	15th 12 14	68·0	12 33 0
				„ 12 21	68·0	5 40 50
August ..	10th 10 6	63·5	5·89609	10th 11 22	63·0	12 32 2
				„ 11 46	63·0	5 40 27
Septemb'r	23rd 15 43	60·0	5·90375	24th 9 30	51·8	12 32 14
				„ 9 56	52·0	5 38 11
October	15th 10 44	50·1	5·89966	15th 12 45	57·0	5 38 54
Novemb'r	14th 9 53	39·9	5·89653	15th 12 10	47·9	5 30 38
Decemb'r	17th 10 2	37·9	5·96440	17th 11 54	41·0	12 8 51

DIP OBSERVATIONS.			MAGNETIC INTENSITY.		
MONTH	G. M. T. (CIVIL DAY)	DIP	X. or HORIZONTAL FORCE	Y. OR VERTICAL FORCE	TOTAL FORCE
	D. H. M.	° ' "			
January ..	15th 12 35	69 4 56	3·7055	9·6947	10·3787
February	28th 15 39	69 6 25	3 7043	9·7043	10·3873
March ....	27th 10 50	69 10 34	3·7017	9·7327	10·4129
April ....	21st	68 56 49	3·6972	9·6050	10·2919
May .....	29th 17 20	69 4 48	3·6759	9·6162	10 2950
June .....			3·7226		
July .....	17th 10 49	69 10 9	3·6860	9·6880	10·3656
August ....	28th 16 4	69 17 30	3 6977	9·7814	10·4571
September	24th 12 45	69 14 18	3·7017	9·7645	10·4427
October ..	16th 11 0	68 59 12	3·6990	9·6295	10·3156
November	14th 12 0	69 23 49	3·7481	9·9699	10·6513
December	18th 10 30	69 10 43	3·7075	9·7490	10·4292
Means ....		69 9 1	3·7039	9·7214	10·4025

## DECLINATION OBSERVATIONS.

MONTH.	G.M.T. (CIVIL DAY).	WEST DECLINATION		
		Observation	Monthly Mean	
	D. H. M.	° ' "	° ' "	
January .. ..	5th.. 9 30	19 10 24		
	13th.. 9 15	19 15 14		
	20th.. 9 13	19 26 14		
	26th.. 9 17	19 11 24	19 15 49	
February .. ..	3rd.. 9 14	18 53 14		
	16th.. 9 12	19 15 29		
	23rd.. 8 57	19 12 9		
	24th.. 8 46	19 6 4	19 6 44	
March .. ..	2nd.. 8 54	19 7 34		
	9th.. 8 53	19 0 9		
	16th.. 9 1	19 3 34		
	24th.. 9 5	19 6 34		
April .. ..	31st.. 9 12	18 46 59	19 0 58	
	6th.. 9 12	19 0 24		
	13th.. 8 53	18 46 44		
	21st.. 8 53	19 2 44		
May .. ..	27th.. 9 3	19 9 4	18 59 44	
	4th.. 8 58	19 2 19		
	11th.. 9 14	18 59 49		
	18th.. 9 7	19 5 29		
	26th.. 8 54	18 59 9	19 1 42	

DECLINATION OBSERVATIONS (*Continued*).

MONTH.	G.M.T. (CIVIL DAY).	WEST DECLINATION		
		Observation	Monthly Mean	
	D. H. M.	° ' "	° ' "	
June .. ..	1st.. 9 3	19 2 59		
	8th.. 8 58	18 59 24		
	16th.. 9 2	19 8 19		
	23rd.. 8 57	18 44 39		
	30th.. 9 2	19 4 9	18 59 54	
July .. ..	7th.. 9 9	19 5 29		
	14th.. 9 11	19 2 19		
	27th.. 10 35	18 57 54	19 1 54	
August .. ..	10th.. 9 18	18 58 24		
	17th.. 9 3	18 49 24		
	24th.. 8 54	19 2 19	18 56 42	
September.. ..	1st.. 9 30	18 53 16		
	28th.. 9 3	18 56 49	18 55 3	
October .. ..	5th.. 9 3	18 55 29		
	19th.. 9 3	18 50 59		
	26th.. 9 2	19 3 14	18 56 34	
November.. ..	2nd.. 9 32	18 59 49		
	9th.. 9 7	19 0 54		
	16th.. 9 45	19 2 29		
	23rd.. 9 12	18 57 34		
	30th.. 9 3	18 52 39	18 58 41	
December .. ..	7th.. 9 12	18 41 59		
	14th.. 9 2	19 16 59		
	21st.. 9 17	19 0 49		
	28th.. 9 10	18 55 24	18 58 48	
Yearly Mean ..			19 1 3	

## DATES OF MAGNETIC DISTURBANCES.

The disturbances are divided into three classes, *small*, *moderate*, and *greater*; these are indicated by the initial letters of the classes, and the letter *c* denotes *calm*. The days are reckoned astronomically, from noon to noon. The asterisk signifies that the record was partly or wholly lost, according as it stands, with or without an initial letter.

MONTH.		Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.
Day	1	c*	s	c	m	s	c	s	s	m	m	s	c
	2	c	c	m	m	s	s	s	m	m	m	s	s
	3	c	c	m	s	s	s	m	m	m	s	s	c
	4	c	c*	m	s	m	s	c	s	s	s	s	s*
	5	s	s*	g	s	s	m	s	c	s	s	s	s
	6	c	m	s	s	m	s	m	c	s	s	s	m
	7	c	s	s	m	m	s	s	s	c	s	c	m
	8	c	c	c	g	m	s	c	s	m	m	c	s
	9	s	m	m	m	s	c	c	s	g	m	c	m
	10	s	m	s	s	s	c	s	s	g	s	s	m
	11	s	m	c	m	s	s	c	s	g	s	s	m
	12	s	m	m	g	s	c	c	s	c	m	s	m
	13	s	m	s	m	m	s	s	m	m	s	s	m
	14	s	m	m	s	g	m	s	m	m	s	m	m
	15	s	s	m	c	g	s	c	s	s	c	m	m
	16	m	s	m	s	g	s	m	m	m	c	m	s
	17	m	m	m	m	m	s	s	c	c	c	s*	c
	18	m	s	s	m	s	s	c	c	s	m	s	c
	19	m	s	s	c	m	m	m	m	c	m	m*	m
	20	s	s	s	m	s	s	s	s	m	m	m	m
	21	s	s	s	m	s	s	c	m	m	s	m*	m
	22	s	s	c	m	s	s	c	c	m	s	*	m
	23	s	s	m	s	s	s	c	s	m	m	s	c
	24	s	m	m	s	c	s	m	s	s	g	s	c
	25	s	s	s	s	c	s	s	s	s	m	m	c
	26	s	s	s	s	s	s	s	s	m	m	m	c
	27	s	c	s	s	m	s	s	c	m	m	m	s
	28	m	s	c	m	m	c	s*	m	g	m	m	s
	29	c		c	s	m	c	s	m	m	m	s	m
	30	c		m	s	s	c	c	s	m	s	s	m
	31	c		g		s		c	m		s		c
Totals.	s	-	16	14	11	14	20	14	15	7	13	16	7
	m	-	5	9	12	10	3	5	10	15	14	10	15
	g	-	0	0	2	3	0	0	0	4	1	0	0
	c	-	10	5	6	2	7	12	6	4	3	3	9

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APPENDIX.

RESULTS

OF

METEOROLOGICAL OBSERVATIONS

TAKEN AT

ST. IGNATIUS' COLLEGE, MALTA,

BY THE

REV. J. SCOLES, S.J.

1891.

# ST. IGNATIUS' COLLEGE, MALTA.

Lat. 35° 55' N.      Long. 14° 29' E.      Barometer Readings  
reduced to 32° F. at sea level.

## METEOROLOGICAL REPORT.

1891.

JANUARY.

Results of Observations taken during the Month.	Mean for the last 5 Years.
Mean Reading of the Barometer .....inches 30·035	30·051
Highest                    „            on the 31st    „    30·456	30·415
Lowest                    „            on the 22nd   „    29·620	29·538
Range of Barometer Readings .....    „    0·836	0·877
Highest Reading of a Max. Therm. on the 8th    63·0	63·9
Lowest Reading of a Min. Therm. on the 20th    37·8	41·6
Range of Thermometer Readings.....    25·2	22·3
Greatest range in 24 hours on the 25th        19·0	18·4
Mean of all the Highest Readings .....    56·5	58·4
Mean of all the Lowest Readings .....    46·0	47·8
Mean Daily Range .....    10·5	10·6
Mean Temperature (deduced from Max & Min.)    50·5	52·5
Mean Temperature (deduced from Dry Bulb)    50·0	52·1
Adopted Mean Temperature.....    50·3	52·3
Mean Temperature of Evaporation .....    45·4	48·1
Mean Temperature of Dew Point .....    41·8	44·9
Mean elastic force of Vapour .....inches 0·265	0·298
Mean weight of Vapour in a cub. ft. of air grains    3·0	3·4
Mean additional weight required for saturation „    0·9	0·9
Mean degree of Humidity .....    78	80
Mean weight of a cubic foot of air ....grains 548·3	542·9
Fall of Rain .....inches 4·519	3·329
Number of days on which Rain fell .....    17	12
Mean amount of Clouds (an overcast sky=10)    6·0	4·6
Total number of miles of Wind indicated .... 9730	8336
Mean Velocity of Wind per hour .....miles 13·1	11·2



## FEBRUARY.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer ..... inches 30·185	30·064
Highest ,, on the 24th ., 30·482	30·334
Lowest ,, on the 14th ,, 29·753	29·690
Range of Barometer Readings ..... ,, 0·729	0·644
Highest Reading of a Max. Therm. on the 27th 61·5	67·0
Lowest Reading of a Min. Therm. on the 20th 37·7	42·0
Range of Thermometer Readings..... 23·8	25·0
Greatest Range in 24 hours on the 27th..... 20·4	18·8
Mean of all the Highest Readings ..... 56·0	60·7
Mean of all the Lowest Readings..... 44·5	49·0
Mean Daily Range ..... 11·5	11·7
Mean Temperature (deduced from Max. & Min). 49·2	53·9
Mean Temperature (deduced from Dry Bulb) 49·8	54·0
Adopted Mean Temperature ..... 49·5	54·0
Mean Temperature of Evaporation..... 45·0	50·0
Mean Temperature of Dew Point ..... 41·6	47·3
Mean elastic force of Vapour ..... inches 0·263	0·327
Mean weight of Vapour in a cub. ft. of air grains 3·0	3·7
Mean additional weight required for saturation ,, 0·8	0·8
Mean degree of Humidity ..... 79	83
Mean weight of a cubic foot of air..... grains 548·3	541·1
Fall of Rain ..... inches 3·799	1·483
Number of days on which Rain fell..... 12	9
Mean amount of Cloud (an overcast sky=10).. 5·7	4·0
Total number of miles of Wind indicated.... 7030	6893
Mean Velocity of Wind per hour ..... miles 10·5	10·1

## MARCH.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer .... inches 30·036	30·008
Highest ,, on the 6th ,, 30·400	30·404
Lowest ,, on the 13th ,, 29·648	29·513
Range of Barometer Readings ..... ,, 0·752	0·891
Highest Reading of a Max. Therm. on the 11th 71·1	74·6
Lowest Reading of a Min. Therm. on the 4th 39·8	44·2
Range of Thermometer Readings ..... 31·3	30·4
Greatest Range in 24 hours on the 11th 24·6	23·4
Mean of all the Highest Readings ..... 62·4	63·6
Mean of all the Lowest Readings ..... 49·0	51·2
Mean Daily Range ..... 13·4	12·4
Mean Temperature (deduced from Max. & Min.) 55·0	56·6
Mean Temperature (deduced from Dry Bulb) 53·8	56·0
Adopted Mean Temperature..... 54·4	56·3
Mean Temperature of Evaporation ..... 50·0	52·5
Mean Temperature of Dew Point ..... 46·6	49·4
Mean elastic force of Vapour ..... inches 0·318	0·354
Mean weight of Vapour in a cub. ft. of air grains 3·5	4·0
Mean additional weight required for saturation ,, 1·1	1·0
Mean degree of Humidity ..... 77	79
Mean weight of a cubic foot of air .. grains 539·8	536·7
Fall of Rain ..... inches 0·173	0·692
Number of days on which Rain fell..... 4	6
Mean amount of Cloud (an overcast sky=10) 4·6	4·2
Total number of miles of Wind indicated .... 6670	7886
Mean Velocity of Wind per hour ..... miles 9·0	10·6

## APRIL.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer .....inches 29·934	29·930
Highest                   ,,                   on the 18th ,, 30·196	30·246
Lowest                   ,,                   on the 28th ,, 29·605	29·460
Range of Barometer Readings.....,, 0·591	0·786
Highest Reading of a Max. Therm. on the 9th 84·5	75·1
Lowest Reading of a Min. Therm. on the 23rd 49·0	47·9
Range of Thermometer Readings ..... 35·5	27·2
Greatest Range in 24 hours on the 8th..... 30·0	20·9
Mean of all the Highest Readings ..... 67·0	67·5
Mean of all the Lowest Readings ..... 53·7	54·2
Mean Daily Range ..... 13·3	13·8
Mean Temperature deduced from Max. & Min.) 59·4	59·8
Mean Temperature (deduced from Dry Bulb.) 58·4	59·8
Adopted Mean Temperature..... 58·9	59·8
Mean Temperature of Evaporation..... 54·5	55·9
Mean Temperature of Dew Point ..... 51·0	52·8
Mean elastic force of Vapour ..... inches 0·374	0·393
Mean weight of Vapour in a cub. ft. of air grains 4·2	4·4
Mean additional weight required for saturation ,, 1·3	1·4
Mean degree of Humidity ..... 77	77
Mean weight of a cubic foot of air .... grains 532·6	530·6
Fall of Rain .....inches 1·180	0·606
Number of days on which Rain fell ..... 11	5
Mean amount of Cloud (an overcast sky=10) 4·7	4·0
Total number of miles of Wind indicated.... 8830	7869
Mean Velocity of Wind per hour .....miles 12·8	10·9

## MAY.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer ....inches29·906	30·033
Highest ,, on the 20th ,, 30·195	30·197
Lowest ,, on the 11th ,, 29·371	29·651
Range of Barometer Readings ..... ,, 0·824	0·546
Highest Reading of a Max. Therm. on the 5th 76·6	84·0
Lowest Reading of a Min. Therm. on the 20th 50·4	51·1
Range of Thermometer Readings ..... 26·2	32·9
Greatest Range in 24 hours on the 5th ..... 21·1	25·2
Mean of all the Highest Readings ..... 70·5	73·3
Mean of all the Lowest Readings ..... 57·1	58·3
Mean Daily Range ..... 13·4	15·0
Mean Temperature(deduced from Max. & Min.) 62·8	64·4
Mean Temperature (deduced from Dry Bulb) 61·6	64·5
Adopted Mean Temperature..... 62·2	64·5
Mean Temperature of Evaporation..... 58·2	60·3
Mean Temperature of Dew Point ..... 54·8	56·3
Mean elastic force of Vapour .....inches 0·430	0·456
Mean weight of Vapour in a cub. ft. of air grains 4·8	4·9
Mean additional weight required for saturation ,, 1·5	1·9
Mean degree of Humidity ..... 77	73
Mean weight of a cubic foot of air ..grains 527·9	527·2
Fall of rain .....inches 0·255	0·273
Number of Days on which rain fell ..... 4	3
Mean amount of Cloud (an overcast sky=10) 4·3	2·8
Total number of miles of Wind indicated.... 7770	6996
Mean Velocity of Wind per hour .....miles 10·4	9·4

## JUNE.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer .....inches30·033	29·998
Highest                   ,,                   on the 15th   ,, 30·195	30·179
Lowest                   ,,                   on the 6th   ,, 29·879	29·799
Range of Barometer Readings.....   ,, 0·316	0·380
Highest Reading of a Max. Therm. on the 7th 99·6	88·2
Lowest Reading of a Min. Therm. on the 2nd 58·3	59·3
Range of Thermometer Readings ..... 41·3	28·9
Greatest Range in 24 hours on the 6th ..... 35·9	23·2
Mean of all the Highest Readings ..... 83·0	79·2
Mean of all the Lowest Readings..... 64·5	64·4
Mean Daily Range ..... 18·5	14·8
Mean Temperature (deduced from Max. & Min.) 73·5	71·1
Mean Temperature (deduced from Dry Bulb) 71·1	70·6
Adopted Mean Temperature ..... 72·3	70·9
Mean Temperature of Evaporation ..... 64·8	65·6
Mean Temperature of Dew Point ..... 59·6	61·6
Mean elastic force of Vapour.....inches 0·511	0·548
Mean weight of Vapour in a cub. ft. of air grains 5·6	5·9
Mean additional weight required for saturation ,, 2·8	2·3
Mean degree of Humidity ..... 66	72
Mean weight of a cubic foot of air....grains 520·0	520·0
Fall of Rain .....inches 0·020	0·140
Number of days on which Rain fell ..... 1	2
Mean amount of Cloud (an overcast sky=10) 2·7	2·2
Total number of miles of Wind indicated.... 5195	6549
Mean Velocity of Wind per hour..... miles 7·2	9·1

## JULY.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer .....inches36·003	30·025
Highest ,, on the 19th ,, 30·072	30·177
Lowest ,, on the 11th ,, 29·852	29·876
Range of Barometer Readings..... ,, 0·220	0·301
Highest Reading of a Max. Therm. on the 10th 97·2	96·1
Lowest Reading of a Min. Therm. on the 28th 65·2	64·9
Range of Thermometer Readings ..... 32·0	31·2
Greatest Range in 24 hours on the 10th ..... 25·8	25·8
Mean of all the Highest Readings ..... 88·0	86·5
Mean of all the Lowest Readings ..... 70·0	69·6
Mean Daily Range ..... 18·0	16·9
Mean Temperature(deduced from Max. & Min.) 78·5	77·5
Mean Temperature (deduced from Dry Bulb.) 76·9	77·0
Adopted Mean Temperature..... 77·7	77·3
Mean Temperature of Evaporation..... 70·5	70·3
Mean Temperature of Dew Point ..... 65·7	65·4
Mean elastic force of Vapour ..... inches 0·633	0·627
Mean weight of Vapour in a cub. ft. of air grains 6·8	6·7
Mean additional weight required for saturation ,, 3·3	3·4
Mean degree of Humidity..... 67	67
Mean weight of a cubic foot of air ....grains 513·1	514·1
Fall of Rain .....inches ..	..
Number of days on which Rain fell..... ..	..
Mean amount of Cloud (an overcast sky=10) 0·5	0·5
Total number of miles of Wind indicated.... 5425	5212
Mean Velocity of Wind per hour .....miles 7·3	7·0

## AUGUST.

Results of Observations taken during the Month.	Mean for the last 5 years
Mean Reading of the Barometer .....inches 30·019	29·994
Highest                   ,,                   on the 28th ,, 30·124	30·142
Lowest                   ,,                   on the 6th ,, 29·897	29·862
Range of Barometer Readings ..... ,, 0·227	0·280
Highest Reading of a Max. Therm. on the 7th 97·8	95·5
Lowest Reading of a Min. Therm. on the 23rd 67·8	66·7
Range of Thermometer Readings..... 30·0	28·8
Greatest Range in 24 hours on the 19th ..... 27·2	25·1
Mean of all the Highest Readings ..... 88·5	87·1
Mean of all the Lowest Readings..... 71·1	71·7
Mean Daily Range ..... 17·4	15·4
Mean Temperature (deduced from Max. & Min.) 79·0	78·5
Mean Temperature (deduced from Dry Bulb.) 78·4	78·8
Adopted Mean Temperature..... 78·7	78·7
Mean Temperature of Evaporation ..... 72·1	71·8
Mean Temperature of Dew Point..... 67·5	67·0
Mean elastic force of Vapour .....inches 0·673	0·662
Mean weight of Vapour in a cub. ft. of air grains 7·2	7·1
Mean additional weight required for saturation ,, 3·3	3·5
Mean degree of Humidity ..... 69	68
Mean weight of a cubic foot of air ....grains 511·8	511·7
Fall of rain..... ..	0·192
Number of days on which Rain fell..... ..	1
Mean amount of Cloud (an overcast sky=10) 1·5	1·3
Total number of miles of Wind indicated .... 5215	5631
Mean Velocity of Wind per hour.....miles 7·0	7·6

## SEPTEMBER.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer .... inches 30·101	30·052
Highest                   ,,                   on the 14th ,, 30·270	30·248
Lowest                   ,,                   on the 21st ,, 29·994	29·825
Range of Barometer Readings ..... ,, 0·276	0·423
Highest Reading of a Max. Therm. on the 8th 96·6	92·3
Lowest Reading of a Min. Therm. on the 27th 63·9	63·7
Range of Thermometer Readings ..... 32·7	28·6
Greatest Range in 24 hours on the 8th .... 22·4	22·7
Mean of all the Highest Readings..... 84·4	82·9
Mean of all the Lowest Readings ..... 70·4	68·8
Mean Daily Range ..... 14·0	14·1
Mean Temperature (deduced from Max. & Min. 76·4	75·1
Mean Temperature (deduced from dry bulb) 75·2	75·3
Adopted Mean Temperature..... 75·8	75·2
Mean Temperature of Evaporation ..... 69·5	69·2
Mean Temperature of Dew Point ..... 65·3	64·8
Mean elastic force of Vapour ..... inches 0·624	0·615
Mean weight of Vapour in a cub. ft. of air grains 6·7	6·7
Mean additional weight required for saturation ,, 2·8	2·8
Mean degree of Humidity ..... 71	70
Mean weight of a cubic foot of air ....grains 516·7	516·3
Fall of Rain ..... inches 0·650	1·134
Number of days on which Rain fell ..... 4	5
Mean amount of Cloud (an overcast sky=10 2·6	2·3
Total number of miles of Wind indicated.... 5290	6001
Mean Velocity of Wind per hour .....miles 7·3	8·3



## OCTOBER.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer .....inches29·977	30·048
Highest                   ,,                   on the 18th   ,, 30·135	30·292
Lowest                   ,,                   on the 28th   ,, 29·710	29·700
Range of Barometer Readings.....   ,, 0·425	0·592
Highest Reading of a Max. Therm. on the 6th 88·4	87·8
Lowest Reading of a Min. Therm. on the 24th 57·5	55·8
Range of Thermometer Readings ..... 30·9	32·0
Greatest Range in 24 hours on the 3rd ..... 21·4	19·5
Mean of all the Highest Readings ..... 77·5	75·5
Mean of all the Lowest Readings..... 65·4	64·1
Mean Daily Range ..... 12·1	11·4
Mean Temperature (deduced from Max. & Min.) 70·6	68·9
Mean Temperature (deduced from Dry Bulb) 69·0	68·4
Adopted Mean Temperature..... 69·8	68·7
Mean Temperature of Evaporation..... 65·5	63·8
Mean Temperature of Dew Point ..... 62·8	60·1
Mean elastic force of Vapour.....inches 0·572	0·521
Mean weight of Vapour in a cub. ft. of air grains 6·2	5·7
Mean additional weight required for saturation ,, 1·5	1·9
Mean degree of Humidity ..... 81	76
Mean weight of a cubic foot of air.....grains 521·4	523·5
Fall of rain .....inches 1·850	3·323
Number of Days on which Rain fell ..... 10	8
Mean amount of Cloud (an overcast sky=10) 3·8	4·4
Total number of miles of Wind indicated.... 6817	6843
Mean Velocity of Wind per hour .....miles 9·2	9·2

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## DECEMBER.

Results of Observations taken during the Month.	Mean for the last 44 years.
Mean Reading of the Barometer .....inches30·185	30·054
Highest                   ,,                   on the 25th   ,,   80·506	30·388
Lowest                   ,,                   on the 18th   ,,   29·792	29·572
Range of Barometer Readings .....   ,,   0·714	0·811
Highest Reading of a Max. Therm. on the 1st 69·1	67·9
Lowest Reading of a Min. Therm. on the 21st 40·3	43·7
Range of Thermometer Readings..... 28·8	24·2
Greatest Range in 24 hours on the 21st ..... 15·5	17·0
Mean of all the Highest Readings ..... 62·6	61·6
Mean of all the Lowest Readings..... 53·8	51·8
Mean Daily Range ..... 8·8	9·8
Mean Temperature(deduced from Max. & Min.) 57·3	56·1
Mean Temperature (deduced from Dry Bulb) 57·5	55·4
Adopted Mean Temperature..... 57·4	55·7
Mean Temperature of Evaporation..... 53·1	51·6
Mean Temperature of Dew Point..... 49·9	48·4
Mean elastic force of Vapour.....inches 0·360	0·341
Mean weight of Vapour in a cub. ft. of air grains 4·0	3·8
Mean additional weight required for saturation ,, 1·1	1·0
Mean degree of Humidity ..... 78	79
Mean weight of a cubic foot of air ....grains 539·0	539·1
Fall of Rain .....inches 3·404	3·264
Number of days on which Rain fell..... 11	13
Mean amount of Cloud (an overcast sky=10) 5·6	5·0
Total number of miles of Wind indicated.... 9226	8608
Mean Velocity of Wind per hour .....miles 12·4	11·6

## Summary of Observations FOR 1891.

Results of Observations taken during the Year.	Mean for the last 5 years
Mean Reading of the Barometer ..... inches	30·039
Highest           ,,           on December 25th   ,,	30·506
Lowest           ,,           on May 11th       ,,	29·371
Range of Barometer Readings .....	1·135
Highest Reading of Max. Therm. on June 7th	99·6
Lowest Reading of Min. Therm. on Feb. 20th	37·7
Range of Thermometer Readings.....	61·9
Greatest Range in 24 hours on the 6th June	35·9
Mean of all the Highest Readings.....	72·2
Mean of all the Lowest Readings.....	58·6
Mean Daily Range .....	13·6
Mean Temperature (deduced from Max & Min)	64·6
Mean Temperature (deduced from dry bulb)	63·7
Adopted Mean Temperature.....	64·2
Mean Temperature of Evaporation.....	59·0
Mean Temperature of Dew Point.....	55·3
Mean elastic force of Vapour ..... inches	0·437
Mean weight of Vapour in a cub. ft. of air grains	5·0
Mean additional weight required for saturation ,,	1·8
Mean degree of Humidity .....	76
Mean weight of a cubic foot of air grains	529·1
Total fall of rain in the Year .....inches	17·210
Number of days per Month on which Rain fell	81
Mean amount of cloud (an overcast sky=10)	3·9
Total number of miles of wind indicated	82648
Mean velocity of wind per hour .....miles	9·4
<p>The maximum monthly mean height of the Barometer was in  November, 1889, and was .....inches 30·249</p> <p>The minimum   ,,       ,,       in January, 1886, and was   ,,       29·844</p>	

The maximum yearly mean height of the Barometer was in	
1884, and was .....	inches 30·057
The minimum „ „ in 1885, and was .....	„ 30·009
The greatest monthly range of the Barometer was in	
January, 1886, and was .....	„ 1·201
The least „ „ in August, 1883, and was..	„ 0·188
The highest reading of the Barometer, during 5 years, was	
on January 26th, 1887, and was .....	„ 30·627
The lowest „ „ on the 17th January, 1886, and was	„ 29·155
Extreme range .....	„ 1·472
The highest temperature was on July 20th, 1889, and was	„ 104·1
The lowest „ „ February 20th, 1891	„ 37·7
The highest mean temperature of a month was in August,	
1885, and was .....	83·2
The lowest „ „ February, 1891, and was	49·5
The greatest monthly mean weight of vapour in a cubic foot	
of air was in August, 1885, and was .....	grains 7·9
The least „ „ January and February, 1891, and was	„ 3·0
The highest observed Dew-point was on the 30th August,	
1885, and was .....	78·7
The lowest „ „ 19th January, 1891, and was	28·6
The greatest fall of rain in a month, was in December, 1889, and	
was.....	inches 8·952
The greatest number of days on which rain fell in one month	
was in January, 1889 .....	days 24
The highest temperature registered in sunshine was on	
the 20th July, 1889, and was.....	158·8
The lowest temperature registered on ground was on	
the 25th January, 1891, and was .....	32·5
The highest observed sea temperature was on the 5th August,	
1887, and was .....	85·0
The lowest „ „ 23rd January, 1891, and was	56·0
The smallest mean amount of cloud observed in one month	
was in August, 1890, and was .....	0·0
The greatest „ „ in December, 1888, and was	6·4

On Ground, the lowest reading was  $50.0^{\circ}$  on the 2nd.

The Sea has risen from  $66.5^{\circ}$  to  $75.5^{\circ}$ .

Lightning was seen on the 18th.

Temperature in Screen above  $90^{\circ}$  on 5 days. In Sunshine above  $150^{\circ}$  on 5 days.

#### JULY.

The Dew-point ranged between  $52.5^{\circ}$  on the 4th and  $72.3^{\circ}$  on the 31st.

In Sunshine, the highest reading was  $151.6$  on the 10th.

On Ground, the lowest reading was  $59.5^{\circ}$  on the 28th.

The Sea has risen from  $80.0^{\circ}$  to  $82.2^{\circ}$ .

#### AUGUST.

The Dew-point ranged between  $74.3^{\circ}$  on the 5th and  $56.6^{\circ}$  on the 17th.

In Sunshine, the highest reading was  $150.6^{\circ}$  on the 5th.

On Ground, the lowest reading was  $59.5$  on the 11th.

The Sea has fallen from  $82.5^{\circ}$  to  $81.0$ .

Lightning was seen on the 23rd.

#### SEPTEMBER.

The Dew-point ranged between  $72.6^{\circ}$  on the 16th and  $53.4^{\circ}$  on the 24th.

In Sunshine, the highest reading was  $148.6^{\circ}$  on the 8th.

On Ground, the lowest reading was  $57.0^{\circ}$  on the 27th.

The Sea has fallen from  $81.0^{\circ}$  to  $76.0^{\circ}$ .

Thunderstorms passed on the 19th and 20th.

Lightning was seen on the 6th, 18th, 21st, and 28th.

#### OCTOBER.

The Dew-point ranged between  $71.8^{\circ}$  on the 6th &  $47.5^{\circ}$  on the 31st.

In Sunshine, the highest reading was  $144.0^{\circ}$  on the 3rd.

On Ground, the lowest reading was  $51.2$  on the 24th.

The Sea has fallen from  $76.3^{\circ}$  to  $71.0^{\circ}$ .

Thunderstorms passed on the 6th, 13th, 22nd, 26th, and 28th.

Lightning was seen on the 3rd, 4th, 5th, 7th, 8th, 9th, 10th, & 27th.

Total Rainfall since last June  $2.500$  inches.

the average of 5 years,  $4.659$  inches.

### NOVEMBER.

The Dew-point ranged between  $44.5^{\circ}$  on the 1st, &  $66.2$  on the 6th.

In Sunshine, the highest reading was  $130.0^{\circ}$  on the 16th.

On Ground, the lowest reading was  $45.5^{\circ}$  on the 3rd.

The Sea has fallen from  $71.0^{\circ}$  to  $67.3^{\circ}$ .

Thunderstorms passed on the 3rd and 10th.

Lightning was seen on the 1st, 6th, 7th, and 8th.

Total Rainfall since last June 3.860 inches.

the average of 5 years, 8.769 inches.

### DECEMBER.

The Dew-point ranged between  $59.0^{\circ}$  on the 1st &  $35.8^{\circ}$  on the 19th

In Sunshine, the highest reading was  $116.8^{\circ}$  on the 9th.

On Ground, the lowest reading was  $33.3^{\circ}$  on the 21st.

The Sea has fallen from  $67.3^{\circ}$  to  $61.5^{\circ}$ .

Lightning was seen on the 1st.

Hail fell on the 19th.

Total Rainfall since last June 7.264 inches.

the average of 5 years, 12.033 inches.

---

### NOTES FOR THE YEAR.

Dewpoint ranged between  $28.6^{\circ}$  on the 19th January, and  $74.3^{\circ}$  on the 5th August.

In Sunshine, the highest reading was  $155.7^{\circ}$  on the 8th June.

On Ground, the lowest reading was  $32.5^{\circ}$  on the 25th January.

The Sea has varied from  $56.0^{\circ}$  in January to  $82.5^{\circ}$  in August.

Thunderstorms passed on 13 days.

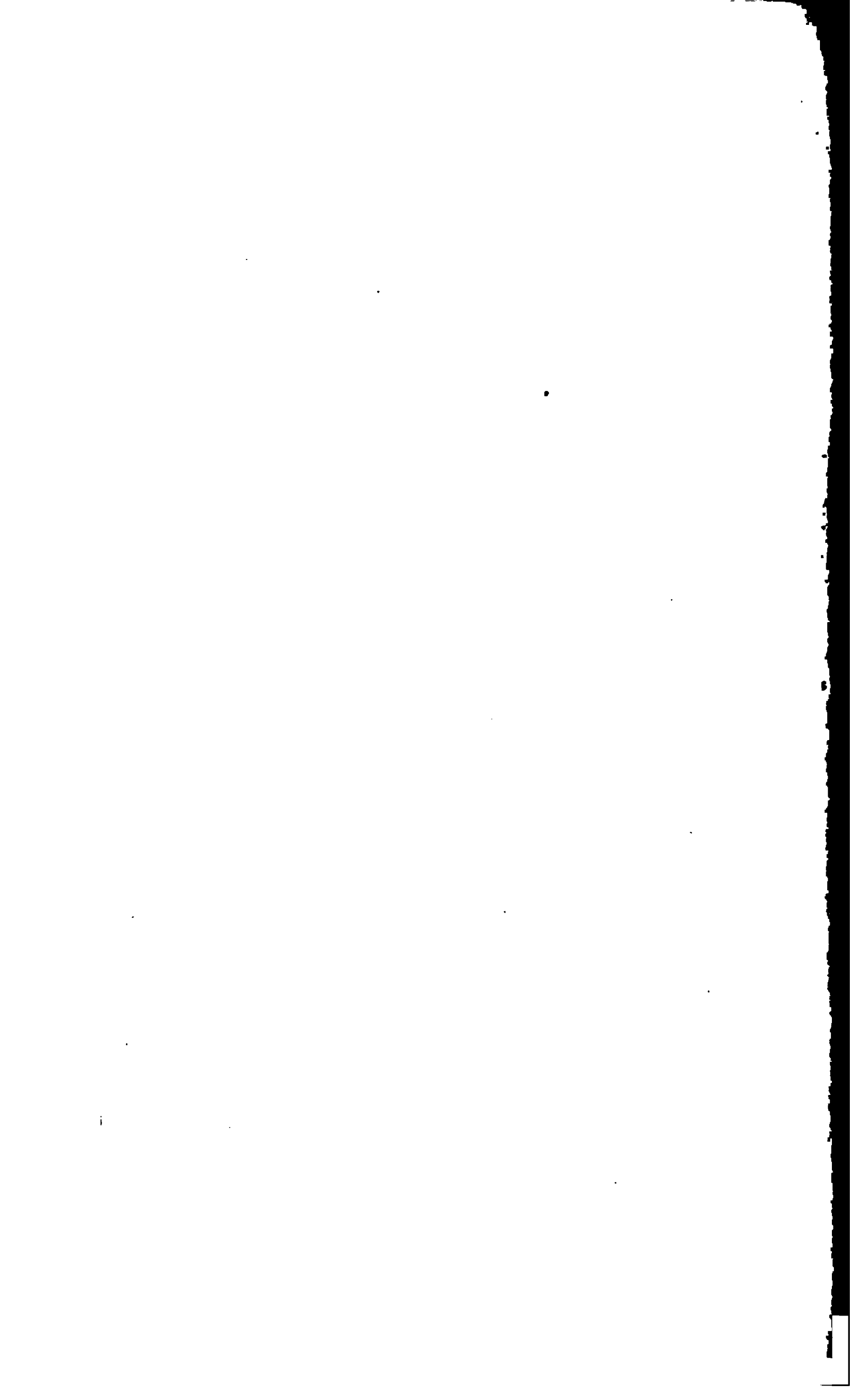
Lightning was seen on 20 days.

Hail fell on 14 days.

Snow fell on the hills once in January. Standing water froze during the same month.

J. SCOLES, S.J.

*St. Ignatius' College.*









*With 1*







STONYHURST COLLEGE  
OBSERVATORY.

# RESULTS

OF

METEOROLOGICAL, MAGNETICAL,

AND

SOLAR OBSERVATIONS

BY THE

REV. W. SIDGREAVES, S.J., F.R.A.S.

1892.

CLITHEROE :

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1893.





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## INTRODUCTION.

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The meteorological work of the observatory has been carried on under the immediate direction of Mr. Ronchetti, assisted by Mr. Burns. All the instruments are in good condition; and the self recorders, both photographic and mechanical, continue to give full satisfaction. The only exception to perfection is the anemograph: The helix-pencil of this instrument is somewhat worn, and its tracing is not so good as it used to be; but the imperfection is hardly at all detrimental to the records. Duplicates have been made of all the curves, and one set has been sent regularly to the meteorological office together with the monthly report. A weekly report is also sent to the same office, and a monthly report to the Registrar General.

Of the magnetical instruments, those in use for the absolute measures are all in good condition; and the absolute measures of force have been made regularly every month, by the system of vibrations and deflections. The horizontal direction has been observed every week, nearly always on the Monday at 4 p.m. The

differential self-recorders have been continuously at work, with the few exceptions needed for adjustments and cleaning. At the end of January an attempt was made to adjust the suspension threads of the horizontal force magnet to give the value  $\cdot 0005$  C.G.S. unit of force to one centimetre of the curve-ordinate: as agreed to at the International Polar Congress.

This operation was found to be greatly facilitated by the telescopes and scales attached to the instruments for eye-observations. The value of one division of the scale in millimetres of the curve-ordinate having been previously determined, the equivalent number of scale divisions for  $\cdot 0005$  C.G. S. unit of force per centimetre was computed from a single set of deflections, without the need of waiting for a photographic impression upon the sensitive paper. The separation of the threads was then adjusted to give the required scale-deflection, by successive small changes and repeated deflections. One double deflection, obtained by reversing the deflector in its stirrup, was enough for testing the effect, and could be completed within a minute of time; but several trials were needed, before a satisfactory result was obtained. At this date the adjustments were left for the value  $\cdot 00047$ , as it was thought that a nearer approximation was unnecessary. But the magnetic disturbances of February and March showed, by a comparison of the curves with those of the Kew Observatory, that the balance was too delicate; and a closer approximation had to be attempted. This was effected on March 17th; and the value then obtained was  $\cdot 00050$ .

ASTROPHYSICAL.—Some additions have been made to the working gear of the large grating spectrometer, in order to bring the spectra of solar spots and prominences within the reach of the camera and of the observer. A concave lens has been mounted

opposite the slit to enlarge the solar image given by a 4 inch lens. This arrangement has been found to work very well. The spot-images can be seen distinctly on the face of the slit, and an accurate focus can be obtained by a sliding movement of the concave enlarger, without shifting the objective. The working gear of the heliostat has also been improved. The driving wheel has been separated from the axle of the clock by a set of differential wheels, in order to employ a slow-motion-rod upon the wheel without affecting the clock. The two motions of the reflector are now under the control of the observer, who can easily retain the spot-image upon the slit, independently of the accurate running of the clock, and eye observations of the spectrum of a spot or prominence can be made without difficulty. But for the photographic plate, greater accuracy is needed in the working of the heliostat than for the eye ; a shift of the image from one part of the slit to another is no inconvenience to the eye, but it is fatal to the photographic impression. To protect the plate from this mishap, a small telescope is placed to view the spot spectrum by one of the lower orders of spectra while the camera is taking the picture from a higher order. The spots-spectrum-band is adjusted to the cross-lines of the eye piece and is watched by the observer during the exposure. If the spot band disappears or wanders from the cross-lines, the light is shut off from the camera until the readjustment is made. In this way a few photographs of spot spectra have been obtained in the green yellow region. But the favourable opportunities have been few : the spots have not been wanting so much as the calm clear days ; a little wind is enough to agitate the reflector of the home-made heliostat too much for the sensitive plate. It is hoped that, with the more favourable condition of the summer side of the year, success will be more easy.

The eight inch equatorial telescope has been employed as usual upon the solar spots and the chromosphere in the day time, and upon steller spectra at night. Complete drawings of the spots and faculae on the sun's surface have been made on 153 days ; and on 64 days the chromosphere has been measured, together with the prominences, all round the limb. The total number of photographs obtained of stellar spectra, since the completion of the instrumental adjustments in October 1891, is 160. These are of the brighter stars, including some of the 3rd and 4th magnitudes. But many of them are repetitions of the same star ; only 40 separate stars appear on the list. This small show of results is mainly owing to the dearth of fine nights, bright enough for the purpose, together with the long exposure needed to make up for the small optical power in use ; and not a little to the circumstances under which the observatory is necessarily worked, which make it impossible to take the full advantage of the morning side of a clear night.

These lists will nearly close the record of work with the eight inch equatorial objective. The new glass, of 15 inches, to the memory of the late Father Perry, is expected to be ready before the end of February. We hope to obtain some interesting comparisons between the spectra already photographed, and the same when given by the greater dispersion that may be employed upon the better light from the greater objective.

The most valuable plates of the collection are two of the spectrum of the new star in Auriga, for which we are so much indebted to Dr. Huggins, whose timely telegraphic message put us in readiness for the exceptionally clear night of the 3rd of February, when the star was at its brightest. An account of these photographs, of the

instrument employed, and of the experiments connected with it is given in the August No. of "Astronomy and Astrophysics." A preliminary discussion of the spectrum together with a map and catalogue of the lines was presented to the Royal Astronomical Society in May, and will appear in the next volume of the Society's memoirs. Further discussions relating to the offered explanations of the origin of the star have been sent to the "Observatory (October, 1892), to the journal of the British Astronomical Association (Vol. iii., No. 1) and to "Astronomy and Astrophysics" (December, 1892).

WALTER SIDGREAVES, S J.

# Stonyhurst Observatory.

Lat. 53° 50' 40" N. Long. 9m. 52s. 68 w. Height of the Barometer  
above the sea, 381ft.

## METEOROLOGICAL REPORT.

JANUARY, 1892.

Results of Observations taken during the Month.		Mean for the last 45 years.
Mean Reading of the Barometer .....	29·384	29·438
Highest                   ,,                   on the 25th ..	30·055	30·285
Lowest                   ,,                   on the 7th ..	28·786	28·575
Range of Barometer Readings .....	1·269	1·710
Highest Reading of a Max. Therm. on the 29th	49·0	51·5
Lowest Reading of a Min. Therm. on the 8th	17·2	20·8
Range of Thermometer Readings .....	31·8	30·7
Mean of all the Highest Readings .....	40·2	42·2
Mean of all the Lowest Readings .....	30·1	32·5
Mean Daily Range .....	10·1	9·7
Deduced Monthly Mean (from Mean of Max. and Min.) .....	35·0	37·1
Mean Temperature from Dry Bulb.....	35·3	37·1
Adopted Mean Temperature.....	35·2	37·1
Mean Temperature of Evaporation .....	33·9	36·0
Mean Temperature of Dew Point .....	32·1	33·8
Mean elastic force of Vapour .....	0·180in	0·220in
Mean weight of Vapour in a cub. ft. of air ....	2·1gr	2·4gr
Mean additional weight required for saturation	0·3gr	0·4gr
Mean degree of Humidity (saturation 1·00)	0·87	0·86
Mean weight of a cubic foot of air .....	550·8gr	544·5gr
Fall of Rain .....	4·230in	4·183in
Number of days on which Rain fell.....	21	19·6



JANUARY, 1892.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	5	3	0	3	3	12	3
Mean Velocity in miles per hour	2.5	5.8	9.6	0	2.6	17.0	12.6	13.3
Total No. of miles for each Direction	121	699	688	0	189	1223	3624	958

The total number of miles registered during the month was 7502.

The max. Velocity of the wind was 38 miles per hour. Direction W. by S. on the 29th at 11 a.m.

Mean amount of Cloud (an overcast sky being indicated by 10.0) 6.8

In the month of January, the highest reading of the Bar-

ometer during 45 years was on the 18th in 1882, and was 30.480

The lowest " " 26th, 1884.... 27.803

The highest Temperature " 7th, 1887.... 59.9

The lowest " 15th, 1881.... 4.6

The highest adopted mean temperature of the month, 1875 42.5

The lowest " " 1881.... 29.2

The barometer readings were generally low during the month, without any very low readings. There were ten rainless days, and these were equally divided between the days of higher and lower barometric pressure. Snow fell on the 6th, 7th, 8th, 10th, 14th, and 19th. Hail on the 3rd. Lightning on the 6th. Aurora Borealis on the 4th. Ground frost on 23 days.

**FEBRUARY, 1892.**

### Results of Observations taken during the month.

Mean for the  
last  
45 years.

Mean Reading of the Barometer .....	29.349	29.510
Highest .. on the 13th ....	30.169	30.066
Lowest .. on the 2nd ....	28.505	28.698
Range of Barometer Readings .....	1.664	1.368
Highest Reading of a Max. Therm. on the 11th	51.2	52.0
Lowest Reading of a Min. Therm. on the 18th	8.1	22.4
Range of Thermometer Readings.....	43.1	29.6
Mean of all the Highest Readings .....	43.6	44.3
Mean of all the Lowest Readings.....	31.2	33.6
Mean Daily Range .....	12.4	10.7
Deducted Monthly Mean (from Mean of Max. and Min) .....	37.0	38.3
Mean Temperature from dry bulb .....	37.3	38.3
Adopted Mean Temperature .....	37.2	38.3
Mean Temperature of Evaporation .....	35.6	36.9
Mean Temperature of Dew Point.....	33.3	34.7
Mean elastic force of Vapour.....	0.191in	0.192in
Mean weight of Vapour in a cubic ft. of air ..	2.2gr	2.4gr
Mean additional weight required for saturation	0.4gr	0.4gr
Mean degree of Humidity (saturation 1.00) ..	0.86	0.87
Mean weight of a cubic foot of air .....	547.7gr	548.8gr
Fall of Rain .....	3.474 in	3.135in
Number of days on which Rain fell.....	15	16.9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	9	4	0	0	4	9	1
			—		—			
Mean Velocity in miles per hour	4.2	6.3	11.1	0	0	15.7	14.1	10.2
			—	—				
Total No. of miles for each Direction	202	1359	1063	0	0	1015	3042	290

The total number of miles registered during the month was 6971.  
The max. Velocity of the wind was 38 miles per hour. Direction  
E at 1 a.m. on the 21st.

## FEBRUARY, 1892.

Mean amount of Cloud (an overcast sky being indicated by 10 0 7 8

In the month of February, the highest reading of the Barometer during 45 years, was on the 11th, in 1849, and was 30 452

The lowest " " 6th, 1867.... 28 208

The highest Temperature " 8th, 1877.... 58 3

The lowest " " 18th, 1892.... 8 1

The highest adopted mean temperature of the month, 1869.... 94 4

The lowest " " 1855.... 28 6

The mean barometric pressure was low. There were 14 rainless days, and of these nine were accompanied with low readings of the barometer. A heavy snow fall occurred on the 17th, giving 6½ inches in four hours. It was followed by excessive cold on the 18th, the thermometer falling to 8° Fahr. - the lowest recorded temperature in February during 45 years. Snow also on the 16th. Ground frost on 17 days.

# MARCH, 1892.

Result of Observations taken during the Month.		Mean for the last 45 years
Mean Reading of the Barometer .....	29·613	29·470
Highest                   ,,                   on the 30th ..	30·229	30·084
Lowest                   ,,                   on the 10th ..	28·717	28·687
Range of Barometer Readings .....	1·512	1·397
Highest Reading of a Max. Therm. on the 22nd	60·3	56·9
Lowest Reading of a Min. Therm. on the 11th	12·6	22·3
Range of Thermometer Readings .....	47·7	34·6
Mean of all the Highest Readings .....	45·4	46·9
Mean of all the Lowest Readings .....	27·9	34·0
Mean Daily Range .....	17·5	12·9
Deducted Monthly Mean from Mean of Max. and Min. ....	35·6	39·6
Mean Temperature from Dry Bulb.....	35·7	39·8
Adopted Mean Temperature.....	35·6	39·7
Mean Temperature of Evaporation.....	33·7	37·8
Mean Temperature of Dew Point .....	30·9	35·2
Mean elastic force of Vapour .....	0·173in	0·204 in
Mean weight of Vapour in a cub. ft. of air.....	2·0gr	2·4gr
Mean additional weight required for saturation..	0·4gr	0·5gr
Mean degree of Humidity (saturation 1·00)..	0·82	0·85
Mean weight of a cubic foot of air .....	554·7gr	546·7gr
Fall of Rain .....	1·044in	3·108in
Number of days on which Rain fell.....	8	17·5

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	4	5	5	1	2	2	7	5
Mean Velocity in miles per hour	5·6	10·8	8·6	12·5	11·7	5·8	4·7	7·8
Total No. of miles for each Direction	538	1299	1028	300	560	277	787	936

The total number of miles registered during the month was 5725.  
The max. Velocity of the wind was 39 miles per hour. Direction N, on the 10th, at 6 p.m.

## MARCH, 1892.

Mean amount of Cloud (an overcast sky being indicated by 10·0)			6·0
In the month of March, the highest reading of the Barometer during 45 years, was on the 6th, in 1852, and was..			30·401
The lowest	„	31st, 1860....	28·199
The highest Temperature	„	25th, 1871....	68·0
The lowest	„	6th, 1886....	11·5
The highest adopted mean temperature of the month, 1871....			44·0
The lowest	„	1855 and 1892	35·6

---

The barometer readings, mean, highest, and lowest. are all well above the averages, and the month was generally fine, dry, and cold. There were 23 days without rain, and on all of these the barometric pressure was consistently high. The mean temperature is considerably below the average, and equals the lowest mean reading for March previously recorded, viz. in 1855. Snow fell on the 8th, 9th, 12th, 14th, 15th, 27th, 28th. Hail on the 28th. Hoar frost on the 26th. Lunar halo on the 9th. Ground frost on 27 days.

## APRIL, 1892.

Results of Observations taken during the Month.		Mean for the last 45 years.
Mean Reading of the Barometer .....	29·596	29·480
Highest                   ,,                   on the 1st ....	30·094	29·965
Lowest                   ,,                   on the 27th....	29·032	28·789
Range of Barometer Readings .....	1·062	1·176
Highest Reading of a Max. Therm. on the 3rd	70·1	66·0
Lowest Reading of a Min. Therm. on the 13th	20·8	28·1
Range of Thermometer Readings.....	49·3	37·9
Mean of all the Highest Readings .....	55 0	55·8
Mean of all the Lowest Readings.....	33·7	37·7
Mean Daily Range .....	21·3	18·1
Deduced Monthly Mean (from Mean of Max. and Min .....	42·8	44·3
Mean Temperature from Dry Bulb .....	43·2	44·4
Adopted Mean Temperature.....	43·0	44·4
Mean Temperature of Evaporation.....	39·4	41·6
Mean Temperature of Dew Point.....	35·1	38·0
Mean elastic force of Vapour.....	0·204in	0·235in
Mean weight of Vapour in a cub. ft. of air..	2·4gr	2·7gr
Mean additional weight required for saturation	0·8gr	0·7gr
Mean degree of Humidity (saturation 1·00) ..	0·74	0·80
Mean weight of a cubic foot of air .....	546·0gr	542·1gr
Fall of Rain .....	2·074in	2·298in
Number of days on which Rain fell.....	11	14·6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	5	14	0	0	0	1	8	2
Mean Velocity in miles per hour	8·2	6·8	0	0	0	7·0	11·8	12·0
Total No. of miles for each Direction	986	2277	0	0	0	173	2265	571

The total number of miles registered during the month was 6272.  
The max Velocity of the wind was 38 miles per hour. Direction  
N.N.E., on the 28th, at 3 a.m.

APRIL, 1892.

**Mean amount of Cloud (an overcast sky being indicated by 10·0) 4·2**

In the month of April, the highest reading of the Barometer

during 45 years, was on the 17th, in 1887, and was.... 30-251

The lowest                   ,,                   ,,                   20th, 1868.... 28·358

The highest Temperature „ 14th, 1852.... 74.1

The lowest	„	„	13th, 1892....	20·8
------------	---	---	----------------	------

The highest adopted mean temperature of the month, 1865 . . . . 48·5

The lowest                „                „                1879....     40·7

Readings of the barometer above the mean still continued, with but seven exceptions, during this month, and the weather was generally fine. The 19 rainless days were accompanied with high readings of the barometer on 13, and with low readings on 6 days. The range of the thermometer readings was 11·4 above the mean, and 20·8, the lowest recorded reading for this month during 45 years was marked on the 13th. Snow fell on the 12th, 13th, 14th, and 18th. Auroræ were seen on the 25th, 26th, and 29th. Lunar Halo on the 4th. Lightning on the 17th. Hail on the 26th and 28th. Ground frost on 17 days.

**MAY, 1892**

Results of Observations taken during the Month.	Mean for the last 45 years.
Mean Reading of the Barometer .....29·541	29·502
Highest                   ,,                   on the 12th..30 046	29·939
Lowest                   ,,                   on the 16th 29·129	28·933
Range of Barometer Readings..... 0·917	1·006
Highest Reading of a Max. Therm. on the 31st 76·8	72 0
Lowest Reading of a Min. Therm. on the 6th 30·4	31·2
Range of Thermometer Readings ..... 46 4	40·8
Mean of all the Highest Readings ..... 61·1	59·6
Mean of all the Lowest Readings ..... 42 9	42·1
Mean Daily Range ..... 18·2	17 5
Deduced Monthly Mean (from Mean of Max. and Min. .... 50·3	49·0
Mean Temperature from Dry Bulb. .... 50·7	49·5
Adopted Mean Temperature..... 50·5	49·3
Mean Temperature of Evaporation..... 47·1	46·1
Mean Temperature of Dew Point ..... 43·5	42·5
Mean elastic force of Vapour ..... 0·283in	0·276in
Mean weight of Vapour in a cub.ft. of air ..... 3·3gr	2·2gr
Mean additional weight required for saturation 0·9gr	0·9gr
Mean degree of Humidity (saturation 1·00.... 0·78	0·76
Mean weight of a cubic foot of air..... 536·4gr	537·0gr
Fall of Rain ..... 5·689in	2·627in
Number of days on which Rain fell ..... 18	15·3

No. of days in the month on which the prevailing wind was	N 7	NE 4	E 0	SE 0	S 3	S W 14	W 3	NW 0
Mean Velocity in miles per hour	7.6	12.0	0	0	14.0	11.4	7.8	0
Total No. of miles for each Direction.	1285	1163	0	0	1016	3844	561	0

The total number of miles registered during the month was 7869.  
The max. Velocity of the wind was 40 miles per hour. Direction  
S.W. on the 16th at noon.



**MAY, 1892.**

**Mean amount of Cloud (an overcast sky being indicated by 10·0    7·3**

In the month of May, the highest reading of the Barometer

during 45 years, was on the 22nd, in 1855, and was .... 30-124

**The lowest                „                „                28th, 1877.... 28·559**

The highest Temperature	„	19th, 1864....	82·5
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The lowest	„	„	4th, 1855....	23·5
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**The highest adopted mean temperature of the month, 1848.... 55.1**

The lowest	„	„	1855....	45·0
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The mean reading of the barometer was still above the average and the first third of the month was characterised by fine days and cloudless nights. A generally steady rise of the mercury was succeeded on the 12th by an equally steady fall, and wet weather prevailed, the rain-fall, which occurred on 18 days, exceeding the mean for this month by 3 inches. Readings of the barometer above the mean, with two exceptions, and generally high, corresponded to the 13 rainless days. The adopted mean temperature was 1·2 above the average, and the range was 5·6 in excess of the same. Thunderstorms occurred on the 25th and the 31st, the latter storm being accompanied at 3 p.m. with hail and heavy rain, three-tenths of an inch falling in 5 minutes. Rainbow on the 29th. Auroræ on the 5th and 6th. Ground frost on 7 days.

## JUNE, 1892.

Results of Observations taken during the Month.		Mean for the last 45 years.
Mean Reading of the Barometer .....	29·552	29·539
Highest                   ,,                   on the 8th....	29·997	29·889
Lowest                   ,,                   on the 2nd....	29·053	29·035
Range of Barometer Readings.....	0·944	0·854
Highest Reading of a Max. Therm. on the 9th	81·0	77·0
Lowest Reading of a Min. Therm. on the 17th	34·1	38·8
Range of Thermometer Readings .....	46·9	38·2
Mean of all the Highest Readings .....	64·2	65·6
Mean of all the Lowest Readings .....	45·6	47·9
Mean Daily Range .....	18·6	17·7
Deduced Monthly Mean (from Mean of Max. and Min.....	53·1	54·9
Mean Temperature from dry bulb .....	53·9	55·0
Adopted Mean Temperature.....	53·5	55·0
Mean Temperature of Evaporation.....	49·4	51·9
Mean Temperature of Dew Point.....	45·3	48·5
Mean elastic force of Vapour.....	0·302in	0·355in
Mean weight of Vapour in a cub. ft. of air.....	3·4gr	3·9gr
Mean additional weight required for saturation	1·2gr	0·9gr
Mean degree of Humidity (saturation 1·00..	0·74	0·79
Mean weight of a cubic foot of air.....	533·4gr	542·2gr
Fall of Rain .....	4·671in	3·649in
Number of Days on which rain fell .....	19	16·3

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	4	1	1	0	12	8	1
Mean Velocity in miles per hour	5·8	6·1	3·2	4·2	0	11·0	9·6	6·0
Total No. of miles for each Direction	419	604	77	100	0	3177	1840	141

The total number of miles registered during the month was 6358  
The max. Velocity of the wind was 40 miles per hour; direction S.E. on the 2nd at 8 a.m.



## JULY, 1892.

Results of Observations taken during the Month.		Mean for the last 45 years.
Mean Reading of the Barometer .....	29·608	29·504
Highest                   ,,           on the 24th.....	29·972	29·878
Lowest                   ,,           on the 7th.....	28·970	28·993
Range of Barometer Readings .....	1·002	0·885
Highest Reading of a Max. Therm. on the 3rd	74·3	78·7
Lowest Reading of a Min. Therm. on the 17th	40·2	42·0
Range of Thermometer Readings.....	34·1	36·7
Mean of all the Highest Readings .....	65·0	67·7
Mean of all the Lowest Readings .....	48·4	50·6
Mean Daily Range .....	16·6	17·1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	56·7	57·7
Mean Temperature from dry bulb .....	55·4	57·7
Adopted Mean Temperature.....	56·0	57·7
Mean Temperature of Evaporation .....	52·4	54·7
Mean Temperature of Dew Point .....	49·0	52·1
Mean elastic force of Vapour .....	0·350in	0·389in
Mean weight of Vapour in a cub. ft. of air.....	3·9gr	4·5gr
Mean additional weight required for saturation	1·1gr	1·0gr
Mean degree of Humidity (saturation 1·00) ..	0·77	0·82
Mean weight of a cubic foot of air .....	531·5gr	527·4gr
Fall of Rain .....	1·856in	4·204in
Number of days on which Rain fell .....	10	18·0

No. of days in the month of which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	12	3	0	0	8	7	0
Mean Velocity in miles per hour	10·3	6·3	10·9	0	0	15·1	8·9	0
Total No. of miles for each Direction	247	1826	782	0	0	2891	1495	0

The total number of miles registered during the month was 7241.  
The max. Velocity of the wind was 44 miles per hour. Direction  
W.S.W. on the 8th at noon.

**JULY, 1892.**

Mean amount of Cloud (an overcast sky being indicated by 10·0)			7·8
In the month of July, the highest reading of the Barometer			
during 45 years, was on the 24th, in 1868, and was....			30 112
The lowest	„	15th, 1877....	28·564
The highest	Temperature	22nd, 1873....	88·2
The lowest	„	1st, 1857....	36·0
The highest	adopted mean temperature of the month, 1852		63·0
The lowest	„	1888....	54·5

Although the rainless days were 23 in number, yet the weather was generally gloomy and overcast until the 20th, when fine days were the rule. The mean height of the barometer still kept above the average, this being the fifth month in succession for which the same fact has to be noted. Of the rainless days, 9 in the first half of the month were accompanied with readings below the mean. The adopted mean temperature still remained below, with a range above the average. The rainfall fell short of the mean by  $2\frac{1}{2}$  inches. Thunderstorm on the 3rd. Solar halos on the 4th and 18th, the latter being followed by one rainy day with a fall in the barometer, to be succeeded by a steady rise, and a spell of fine weather.

## AUGUST, 1892.

Results of Observations taken during the Month.	Mean for the Year 45 years.
Reading of the Barometer .....29.446	29.486
"                    on the 10th .. 29.646	29.884
"                    on the 30th .. 28.884	28.948
Mean of Barometer Readings ..... .. 0.962	0.936
Highest Reading of a Max Therm. on the 23rd 78.0	77.0
Lowest Reading of a Min Therm. on the 10th 36.0	41.3
Mean of Thermometer Readings..... 42.0	35.7
Mean of all the Highest Readings ..... 66.4	67.1
Mean of all the Lowest Readings..... 49.4	50.4
Daily Range ..... 17.0	16.7
Reduced Monthly Mean (from Mean of Max and Min) ..... 56.2	57.0
Temperature (deduced from Dry Bulb) 56.8	57.4
Reduced Mean Temperature ..... 56.5	57.2
Temperature of Evaporation ..... 53.8	54.5
Temperature of Dew Point ..... 49.4	51.7
elastic force of Vapour ..... 0.338 in	0.387 in
weight of Vapour in a cub. ft. of air 3.8gr	4.3gr
additional weight required for saturation 0.9gr	0.9gr
degree of Humidity (saturation 1.00) .. 0.73	0.73
weight of a cubic foot of air..... 528.0gr	525.2gr
Quantity of Rain ..... 7.222 in	4.973 gr
Number of days on which Rain fell..... 18	19.0

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	4	0	2	5	■	10	1
Mean Velocity in miles per hour	0	7.2	0	3.7	9.9	11.6	9.2	14.0
							10	336

The total number of miles registered during the month was 7115.  
The max. Velocity of the wind was 34 miles per hour. Direction  
S.W., on the 15th, at 3 a.m.

## AUGUST, 1892.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 6·8

In the month of August, the highest reading of the Barometer

during 45 years, was on the 21st, in 1874, and was.... 30·114

The lowest                   ,,                   ,,                   31st, 1876.... 28·555

The highest Temperature                   ,,                   2nd, 1868.... 88·0

The lowest                   ,,                   ,                   13th, 1887... 33·4

The highest adopted mean temperature of the month, 1857 & '84 61·0

The lowest                   ,,                   ,,                   1848.... 52·5

The more than average barometric pressures which had prevailed for five months, were now succeeded by pressures below the mean. The rainfall was correspondingly greater than the normal by nearly three inches. The mean temperature was for a third time in succession below the average. Of the 17 rainless days, five were accompanied with barometric readings below the mean. Lightning on the 13th and 29th. Thunderstorms on the 24th and 30th. Solar halos on the 7th, 10th, 23rd and 26th. Fog on the 8th. A fine display of aurora was witnessed on the 12th, between 9-20 and 10-p.m. G.M.T. Many fine bright streamers were seen extending from N. to S.W., one in the latter quarter of the heavens being remarkably brilliant. Ground frost on the 10th.

SEPTEMBER, 1892.

Results of Observations taken during the Month.							Mean for the last 45 Years.																																					
Mean Reading of the Barometer.....29·473							29·515																																					
Highest                    ,,                   on the 5th ....29·872							30 025																																					
Lowest                    ,,                   on the 30th ....28·940							28·847																																					
Range of Barometer Readings ..... 0·932							1·178																																					
Highest Reading of a Max. Therm. on the 11th 73 2							72·5																																					
Lowest Reading of a Min. Therm. on the 29th 38·4							36·6																																					
Range of Thermometer Readings ..... 34·8							35·9																																					
Mean of all the Highest Readings ..... 61·0							62·2																																					
Mean of all the Lowest Readings ..... 45·9							47·0																																					
Mean Daily Range ..... 15·1							15·2																																					
Deduced Monthly Mean (from Mean of Max. and Min.) ..... 52 2							53 4																																					
Mean Temperature from Dry Bulb ..... 52·4							54·0																																					
Adopted Mean Temperature..... 52·3							53·7																																					
Mean Temperature of Evaporation..... 49·0							51·0																																					
Mean Temperature of Dew Point ..... 45·6							48·3																																					
Mean elastic force of Vapour ..... 0·307in							0·339in																																					
Mean weight of Vapour in a cub. ft. of air..... 3·5gr							4·0gr																																					
Mean additional weight required for saturation 1·0gr							0·8gr																																					
Mean degree of Humidity (saturation 1·00) 0·79							0·82																																					
Mean weight of a cubic foot of air ..... 533·7gr							532·4gr																																					
Fall of rain ..... 5 369in							4·625in																																					
Number of Days on which rain fell..... 21							18·1																																					
<table border="1"> <thead> <tr> <th>No. of days in the month on which the prevailing wind was</th> <th>N</th> <th>NE</th> <th>E</th> <th>SE</th> <th>S</th> <th>SW</th> <th>W</th> <th>NW</th> </tr> </thead> <tbody> <tr> <td></td> <td>1</td> <td>3</td> <td>0</td> <td>0</td> <td>10</td> <td>9</td> <td>4</td> <td>3</td> </tr> <tr> <td>Mean Velocity in miles per hour</td> <td>3·8</td> <td>10·8</td> <td>0</td> <td>0</td> <td>11·5</td> <td>12·6</td> <td>12·4</td> <td>6·0</td> </tr> <tr> <td>Total No. of miles for each Direction.</td> <td>91</td> <td>777</td> <td>0</td> <td>0</td> <td>2766</td> <td>2727</td> <td>1193</td> <td>432</td> </tr> </tbody> </table>									No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW		1	3	0	0	10	9	4	3	Mean Velocity in miles per hour	3·8	10·8	0	0	11·5	12·6	12·4	6·0	Total No. of miles for each Direction.	91	777	0	0	2766	2727	1193	432
No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW																																				
	1	3	0	0	10	9	4	3																																				
Mean Velocity in miles per hour	3·8	10·8	0	0	11·5	12·6	12·4	6·0																																				
Total No. of miles for each Direction.	91	777	0	0	2766	2727	1193	432																																				
<p>The total number of miles registered during the month was 7986.  The max. Velocity of the wind was 30 miles per hour. Direction S.W. by W., on the 2nd, at 4 a.m.</p>																																												



## SEPTEMBER, 1892.

Mean amount of Cloud (an overcast sky being indicated by 10·0)			8·0
In the month of September, the highest reading of the Barometer during 45 years, was on the 15th, in 1851, and was			
30·274			
The lowest	„	2nd, 1883....	28·323
The highest Temperature	„	6th, 1868....	85·0
The lowest	„	25th, 1885, and	
30th, 1888..			29·8
The highest adopted mean temperature of the month, 1865			59·1
The lowest	„	1863	50·9

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A wet month with only 9 days on which rain did not fall, although the amount of fall was not much above the average. Of these 9 days, 2 were accompanied with low barometric pressures. The mean pressure for the month was below the average, as also the adopted mean temperatures. Thunderstorm on the 2nd, and distant thunder was heard on the 12th and 30th. Hail on the 2nd and 30th. Rainbow on the 3rd. A double lunar rainbow with the colours fairly distinct, at 10-20 p.m. on the 7th, Aurora Borealis with coloured streamers, from 8-0 to 11-0 p.m. on the 21st. Ground frost on the 30th.

1. The first part of the document is a header section containing the following information:
 

- Page Number: 1
- Date: 10/10/2010
- Page Number: 1

2. The second part of the document is a table with the following columns:
 

Item	Quantity	Unit	Price	Total
1.000	1.000	1.000	1.000	1.000
2.000	2.000	2.000	2.000	2.000
3.000	3.000	3.000	3.000	3.000
4.000	4.000	4.000	4.000	4.000
5.000	5.000	5.000	5.000	5.000
6.000	6.000	6.000	6.000	6.000
7.000	7.000	7.000	7.000	7.000
8.000	8.000	8.000	8.000	8.000
9.000	9.000	9.000	9.000	9.000
10.000	10.000	10.000	10.000	10.000

3. The third part of the document is a table with the following columns:
 

Item	Quantity	Unit	Price	Total
1.000	1.000	1.000	1.000	1.000
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3.000	3.000	3.000	3.000	3.000
4.000	4.000	4.000	4.000	4.000
5.000	5.000	5.000	5.000	5.000
6.000	6.000	6.000	6.000	6.000
7.000	7.000	7.000	7.000	7.000
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9.000	9.000	9.000	9.000	9.000
10.000	10.000	10.000	10.000	10.000

4. The fourth part of the document is a table with the following columns:
 

Item	Quantity	Unit	Price	Total
1.000	1.000	1.000	1.000	1.000
2.000	2.000	2.000	2.000	2.000
3.000	3.000	3.000	3.000	3.000
4.000	4.000	4.000	4.000	4.000
5.000	5.000	5.000	5.000	5.000
6.000	6.000	6.000	6.000	6.000
7.000	7.000	7.000	7.000	7.000
8.000	8.000	8.000	8.000	8.000
9.000	9.000	9.000	9.000	9.000
10.000	10.000	10.000	10.000	10.000

5. The fifth part of the document is a table with the following columns:
 

Item	Quantity	Unit	Price	Total
1.000	1.000	1.000	1.000	1.000
2.000	2.000	2.000	2.000	2.000
3.000	3.000	3.000	3.000	3.000
4.000	4.000	4.000	4.000	4.000
5.000	5.000	5.000	5.000	5.000
6.000	6.000	6.000	6.000	6.000
7.000	7.000	7.000	7.000	7.000
8.000	8.000	8.000	8.000	8.000
9.000	9.000	9.000	9.000	9.000
10.000	10.000	10.000	10.000	10.000

6. The sixth part of the document is a table with the following columns:
 

Item	Quantity	Unit	Price	Total
1.000	1.000	1.000	1.000	1.000
2.000	2.000	2.000	2.000	2.000
3.000	3.000	3.000	3.000	3.000
4.000	4.000	4.000	4.000	4.000
5.000	5.000	5.000	5.000	5.000
6.000	6.000	6.000	6.000	6.000
7.000	7.000	7.000	7.000	7.000
8.000	8.000	8.000	8.000	8.000
9.000	9.000	9.000	9.000	9.000
10.000	10.000	10.000	10.000	10.000

7. The seventh part of the document is a table with the following columns:
 

Item	Quantity	Unit	Price	Total
1.000	1.000	1.000	1.000	1.000
2.000	2.000	2.000	2.000	2.000
3.000	3.000	3.000	3.000	3.000
4.000	4.000	4.000	4.000	4.000
5.000	5.000	5.000	5.000	5.000
6.000	6.000	6.000	6	

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 OCTOBER, 1892.
 

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--	nt of Cloud (an overcast sky being indic	
--	h of October, the highest reading of th	
	45 years, was on the 5th, in 1884, at	
	"	19th
	Temperature	9th
	"	24th
	adopted mean temperature of the mon	
	"	"

---

Another month, the third in succession, in which the barometric pressure was lower than the average for the month, too, now for the fifth time in succession. The lowest reading of the thermometer occurred on the 24th, and was 22°. On the 1st and 2nd days, two were synchronous with days in 1884. Lightning on the 3rd. Rainbow on the 17th and 22nd. The latter appeared as a double rainbow, with a long narrow streamer of extra light from it in the N W. by N. Lunar halo on the 30th. Ground frost on 17 d

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# NOVEMBER, 1892.

Results of Observations taken during the Month.		Mean for the last 45 years.
Mean Reading of the Barometer .....	29·567	29·311
Highest .. on the 22nd..	30·003	30·050
Lowest .. on the 14th..	29·008	28·567
Range of Barometer Readings .....	0·995	1·483
Highest Reading of a Max. Therm. on 4th & 5th	56·7	55·6
Lowest Reading of a Min. Therm. on the 17th	25·0	25·2
Range of Thermometer Readings .....	31·7	30·4
Mean of all the Highest Readings.....	48·4	46·9
Mean of all the Lowest Readings .....	36·6	36·2
Mean Daily Range .....	11·8	10·7
Deduced Monthly Mean (from Mean of Max. and Min. ....	42·1	41·2
Mean Temperature from dry bulb) .....	42·7	41·5
Adopted Mean Temperature.....	42·4	41·4
Mean Temperature of Evaporation .....	41·4	39·1
Mean Temperature of Dew Point .....	40·2	37·8
Mean elastic force of Vapour .....	0·259 in	0·228 in
Mean weight of Vapour in a cub. ft. of air ....	2·9 gr	2·6 gr
Mean additional weight required for saturation	0·3 gr	0·4 gr
Mean degree of Humidity (saturation 1·00)..	0·86	0·87
Mean weight of a cubic foot of air.....	545·8 gr	544·9 gr
Fall of Rain .....	3·730 in	4·29 in
Number of days on which Rain fell .....	20	19·6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	2	7	1	7	1	8	1
Mean Velocity in miles per hour	2·7	1·9	5·6	4·9	10·7	11·5	12·1	2·3
Total No. of miles for each Direction	197	91	944	117	1806	277	2314	54

The total number of miles registered during the month was 5799.  
The max. Velocity of the wind was 47 miles per hour. Direction  
S.S.E. on the 14th, at 9 p.m.

## NOVEMBER, 1892.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·4

In the month of November, the highest reading of the Barometer

during 45 years, was on the 12th in 1857, and was.....30·350

The lowest                    "                    "                    11th, 1891                    27·938

The highest Temperature                    "                    6th, 1872                    61·9

The lowest                    "                    "                    17th, 1861....                    19·1

The highest adopted mean temperature of the month, 1881....                    47·0

The lowest                    "                    "                    1851....                    36·7

— — —

In this month the mean barometer pressure recovered itself, and rose more than two-tenths above the average. There were, however, very few cloudless days, and the sky was generally dull and overcast. The rainfall was about half-an-inch less than the average, but the number of days on which rain fell about the average. Of the ten rainless days, nine were accompanied by a high barometer. Lunar halo on the 1st. Thick fog on the 7th. Hoar frost on the 18th. Hail showers on the 30th. Ground frost on 14 days.

## DECEMBER, 1892.

Results of Observations taken during the Month.		Mean for the last 45 years.
Mean Reading of the Barometer .....	29·522	29·460
Highest       "       "       on the 27th..	29·899	30·068
Lowest       "       "       on the 12th..	28·816	28·604
Range of Barometer Readings.....	1·083	1·464
Highest Reading of a Max. Therm. on the 18th	49·8	52·9
Lowest Reading of a Min. Therm. on the 25th	14·3	20·0
Range of Thermometer Readings .....	35·5	32·9
Mean of all the Highest Readings .....	39·7	42·9
Mean of all the Lowest Readings .....	27·2	32·7
Mean Daily Range .....	12·5	10·2
Deduced Monthly Mean (from Mean of Max. and Min.) .....	33·5	37·8
Mean Temperature from Dry Bulb) .....	34·5	38·5
Adopted Mean Temperature .....	34·0	38·2
Mean Temperature of Evaporation.....	32·4	36·6
Mean Temperature of Dew Point .....	29·6	34·8
Mean elastic force of Vapour .....	0 164 in	0·204 in
Mean weight of Vapour in a cub. ft. of air ..	1·9gr	2·4gr
Mean additional weight required for saturation	0·4gr	0 4gr
Mean degree of Humidity (saturation 1 00)	0·83	0·87
Mean weight of a cubic foot of air .....	454·7gr	538·7gr
Fall of rain .....	3·894 in	5·268 in
Number of Days on which Rain fell .....	17	9 3

No of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	8	0	7	1	1	0	4	9
Mean Velocity in miles per hour	5·8	0	4·4	4·0	4·4	0	8·9	10·5
Total No. of miles for each Direction	1123	0	741	97	106	0	859	2273

The total No. of miles registered during the month was 5199.  
The max. Velocity of the wind was 34 miles per hour ; direction  
W.S.W., at 5 p.m., on the 17th. The Record for Friday, 23rd,  
was accidentally lost.

In the month of December, the highest reading of the Barometer during 45 years, was on the 22nd in 1849, and was 30.378

**The highest Temperature** .. 9th, 1876.. 58.1

**The highest adopted mean temperature of the month, 1857.. 44.6**

**The lowest**                "                "                1878... 30·3

The mean temperature was very low, owing to the severe frost of the latter half of the month, which was fine, dry, and free from snow. Snow fell on the 4th, 5th, and 8th. Fog prevailed on the 8th, 15th, 16th, 21st and 22nd. Ground frost on 25 days. Lunar halos on the 28th and 30th.

## Summary of Observations FOR 1892.

	Mean for the last 45 years.
Mean Reading of the Barometer .....	29·494
Highest                   ,,                   on March 30th ..	30·229
Lowest                   ,,                   on February 2nd ..	28·505
Range of Barometer Readings .....	1·724
Highest Reading of a Max. Therm. on June 9th	81·0
Lowest Reading of a Min. Therm. on Feb. 18th	8·1
Range of Thermometer Readings .....	72·9
Mean of all the Highest Readings .....	53·6
Mean of all the Lowest Readings .....	37·9
Mean Daily Range .....	15·7
Deduced yearly Mean (from Mean of Max. and Min.) . . . . .	44·8
Mean Temperature of dry bulb.....	45·2
Adopted Mean Temperature .....	45·0
Mean Temperature of Evaporation .....	42·5
Mean Temperature of Dew Point.....	39·4
Mean elastic force of Vapour.....	0·249 in
Mean weight of Vapour in a cubic foot of air	2·8 gr
Mean additional weight required for saturation	0·7 gr
Mean degree of Humidity (saturation 1·00) ..	0·80
Mean weight of a cubic foot of air .....	533·5 gr
Total fall of rain in the Year.....	48·697 in
Number of Days per Month on which Rain fell	16·5

The Maximum monthly mean height of the Barometer was in February, 1891, and was	29·997
The Minimum                   ,,                   in December, 1868, and was	28·984
The Maximum yearly mean height of the Barometer was in 1887, and was	29·582
The Minimum                   ,,                   in 1866, and was	29·389



## SUMMARY, 1892.

The greatest monthly range of the Barometer was in  
 January, 1884, and was ..... 2·409  
 The least ,, ,, in July, 1852, and was ..... 0·505  
 The highest reading of the Barometer, during 45 years, was  
 on January 18th, 1882, and was ..... 30·480  
 The lowest ,, ,, on December 8th, 1886, and was 27·350  
 Extreme range ..... 3·130  
 The highest temperature was on July 15th, 1868, and was.. 88·2  
 The lowest ,, ,, January 15th, 1881.. 4·6  
 The highest adopted mean temperature of a month, July, 1868 62·4  
 The lowest ,, ,, February, 1855.. 28·6  
 The highest adopted mean temperature of a year, 1868.. 49·1  
 The lowest ,, ,, ,, ,, 1879.. 44·1  
 The greatest monthly mean weight of vapour, }  
 in a cubic foot of air ..... } July, 1852.. 5·1gr  
 The least ,, ,, ,, February, 1855.. 1·4gr  
 The greatest fall of rain in a month. was in October, 1870, and  
 was ..... 13·487 in  
 The least ,, ,, ,, March, 1852.. 0·047 in  
 The greatest number of days on which }  
 rain fell in one month ..... } July, 1861, Dec. 1868 31  
 The least ,, ,, ,, March, 1852.. 3

No. of days in the year on which the prevailing wind was .....	N	NE	E	SE	S	SW	W	NW
	39	69	30	8	31	65	92	31
Mean Velocity in miles per hour .....	5·9	7·2	7·4	5·9	10·3	12·2	10·1	9·6
Total No. of miles for each Direction.....	5569	11988	5323	1133	7634	19019	22361	7111

The total No. of miles registered during the year was 80·138.

The Max. Velocity of the wind was 50 miles per hour; direction S.S.W., at Noon, on October 29th. The record of wind for Friday, December 23rd, was accidentally lost.

# DATES OF OCCASIONAL PHENOMENA.

1892.	Frost.	Hoar Frost.	Snow.	Hail
January	1-18, 19-23, 24-27		6, 7, 8, 10, 14, 17, 19	3
February	2-5, 9, 12-26, 28		16, 17,	28
March	1-17, 19-24, 26-31	26	8, 9, 12, 14, 15, 27, 28	28
April	1-4, 11-20, 26-30,		12, 13, 14, 18	26-28
May	1-3, 5-8, 9, 21, 28,			
June	18			
July				
August	10			
September	30			
October	2-7, 11-13, 17-20, 22-27, 30, 31			
November	1-4, 7-9, 11-13, 16-19, 22-24, 25, 30	18		30
December	1-15, 16, 22-31	2, 25-31	4, 5, 8	2, 4

DATES OF OCCASIONAL PHENOMENA.

(Continued.)

1892.	Heavy Rain	Fog.	Thunder.	Lightning.	Lunar Halo.	Solar Halo.
January	27, 28			6	10, 11	
February	7				9	
March				17	4	
April	13, 18, 19, 27, 31		25, 31	25, 31		15, 22
May	4, 10, 28		17, 19	10, 17, 19		4, 18
June	19		3			7, 10, 23, 26
July	7, 12, 23, 26, 29, 30		24, 30	13, 24, 29, 30		
August	1. 6, 27, 29	8	2, 12, 30	2		
September	8, 14, 27			3		
October	30				1	
November	8, 13, 18	8, 15, 16, 21, 22			28, 30	
December						
.	Solar Rainbows were seen, May 29th.		Aurora Borealis, Jan 4th			
	" " " June 20th.		" April 25, 26, 29.			
	" " " Oct. 3rd.		" May 5, 6.			
	Lunar Rainbow was seen, Sept. 7th.		" Aug. 12.			
			" Sept. 21.			
			" Oct. 17, 22.			

## SUMMARY OF SOLAR OBSERVATIONS.

Number of days of Observation in Each Month.

1892	Recorded Sunshine.	Amount of Sunshine expressed in hours.	Number of Sun Drawings, 10 $\frac{1}{4}$ inches to diameter.	Other Drawings and Notes.	Entire Chromosphere Measured.	Chromosphere partially measured.	Spot spectra observed.
January ..	14	44.4	10		6		
February	21	69.7	11		6		
March ..	25	145.9	20		7	2	
April ....	28	202.1	19		5		
May .....	28	171.9	14		8		
June .....	28	206.8	13		9		
July .....	27	155.0	14		7	1	
August ..	25	129.4	5		2		
September	23	114.0	10		2	1	
October ..	25	111.5	14		4		
November	14	34.4	11		2		
December	14	33.1	12		6	1	
Totals ..	272	1418.2	153		64	5	

The figures express, in hundredths of a day, the Greenwich Civil time at which the drawing was made.  
 $c$  denotes chromosphere,  $s$  spot spectra.

[illegible]

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.																	
MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January -	5.8	0.4	3.1	5.6	0	3.6	1.1	0.6	3.1	3.0	5.3	0	0	0	0	3.0	0
February -	2.0	3.0	7.0	0	4.4	0.1	0	3.0	0	0.6	4.5	5.2	6.5	0	0	6.0	0.4
March -	3.0	1.4	0	7.2	4.3	0	0	3.9	6.0	1.3	8.2	8.1	6.9	4.7	0	2.5	0.2
April -	9.5	3.9	9.5	8.3	0	0	4.6	11.1	11.3	12.0	11.5	0.5	6.6	4.3	6.9	7.1	9.9
May -	13.0	3.1	0	12.8	5.0	12.2	4.7	3.4	10.6	13.3	13.9	10.9	0	7.4	4.7	0.8	6.3
June -	11.3	3.8	11.7	5.7	8.3	10.9	8.1	13.0	14.6	7.8	0	11.9	5.3	13.3	5.8	0	13.2
July -	8.0	0.3	4.0	10.5	4.5	4.0	8.4	12.4	1.4	2.0	9.5	4.2	3.1	0	0	0	1.2
August -	4.7	0	6.5	12.8	2.5	7.6	3.1	0	8.1	7.2	0	3.7	0.5	4.6	8.7	0.8	2.2
September -	0	6.3	8.0	6.0	3.2	0	3.3	10.9	0	7.0	0	0	4.6	4.5	0	5.0	9.0
October -	3.0	6.3	0.3	6.0	0.2	0	3.8	5.8	2.0	6.8	6.2	3.8	4.9	0	0	5.2	6.2
November -	5.6	1.4	4.9	0	5.3	0	1.1	0	0.2	0	0	0	0	0	0	0.8	2.9
December -	0	1.6	0	3.4	2.0	2.3	3.4	0	0	c	0	1.8	5.3	0	0	0	0

# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

(Continued)

MONTH	23	24	25	26	27	28	29	30	31	Per centage each month
January -	0	3.9	4.0	0	0	0	0	0	1.9	44.4
February -	8.9	0	3.2	0	1.9	0	0	0	0	17.1
March -	5.1	9.4	9.2	2.0	9.0	2.0	0	0	0	24.2
April -	5.1	9.5	0.8	0.3	8.8	0.3	0	0	0	39.8
May -	0.5	9.0	8.4	9.3	0	0	0	0	0	145.9
June -	4.3	5.4	3.2	9.2	6.5	0	0	0	0	202.1
July -	2.3	0.8	6.0	8.6	8.7	0	0	0	0	48.7
August -	0	7.7	11.5	2.3	2.7	0	0	0	0	85.7
September -	0.6	2.0	0	1.4	5.5	0	0	0	0	41.9
October -	5.6	3.4	1.4	0.7	6.8	0	0	0	0	81.0
November -	1.7	0	0	0	0.8	0	0	0	0	28.9
December -	0	0	0	0	0.8	0	0	0	0	30.2
										33.8
										13.1
										13.7

MONTHLY TABLES FOR EACH HOUR OF RECORDED SUNSHINE.

4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9
0	0	0	0	0.2	7.0	9.2	9.0	8.0	6.0	5.0	0	0	0	0	0	0
0	0	0	0.8	2.5	5.2	9.0	11.0	11.6	12.2	8.9	6.5	2.0	0	0	0	0
0	0	1.3	7.4	11.4	16.4	16.8	17.8	17.3	16.4	14.4	13.1	10.0	3.6	0	0	0
0	1.9	9.6	15.6	19.9	19.9	20.4	18.6	16.0	17.6	19.0	16.1	13.4	10.6	3.5	0	0
0.7	4.7	11.7	12.8	11.1	11.0	12.0	15.9	13.7	15.8	14.7	15.5	13.1	9.9	7.1	2.2	0
2.3	9.5	10.7	11.3	11.9	13.2	15.0	16.3	16.3	16.7	15.0	15.8	16.0	16.8	13.4	6.4	0
0.2	2.4	6.7	9.1	9.3	9.8	10.3	12.9	11.7	13.0	14.0	14.9	15.2	13.0	9.5	2.5	0
0	2.3	6.1	7.3	10.7	13.0	13.6	12.8	12.9	11.8	10.4	10.4	7.5	5.6	4.3	0.5	0
0	0	2.6	6.1	9.0	10.4	12.1	12.2	12.8	13.1	11.6	10.7	8.9	4.3	0.2	0	0
0	0	0	1.7	8.4	13.7	16.6	15.8	16.2	14.6	12.5	9.8	2.2	0	0	0	0
0	0	0	0	0.3	2.7	6.1	6.3	6.7	6.8	4.2	1.3	0	0	0	0	0
0	0	0	0	0.2	3.0	7.6	8.7	7.6	3.5	2.5	0	0	0	0	0	0
3.2	20.8	43.7	72.6	95.4	125.3	148.6	157.5	150.8	147.5	132.2	114	133.3	63.8	33.0	11.6	0





## OBSERVATIONS OF UPPER CLOUDS (CIRRUS).

Date. 1892.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	V'locity (0—6).	Direction.	Force. (0—12).	
January 4	4 p.m.	N.N.W.	1	N.W.	1	
" 8	8-30 a.m.	S.E.	1	W.N.W.	1	S.S.W.
" 9	1-20 p.m.	N.E.	1	N.E. by N.	2	N.W.
" 9	2-15 p.m.	N.	1	N.	1	N.W.
" 10	9-0 a.m.	S.	1	N.E. by N.	0	N.E.
" 18	9-0 a.m.	W. by S.	1	E. by N.	1	E.
" 24	2-30 p.m.	N.N.W.	1	W.	3	N.W.
Feb. 11	1-30 p.m.	.. .. .	...	W. by N.	3	W. by N.
" 15	4-30 p.m.	E.N.E.	1	E. by N.	4	E.
" 24	9-10 a.m.	S.E.	2	N.E. by N.	1	E.S.E.
March 11	9-30 a.m.	N. by E.	2	S.E.	0	N.
" 31	3-30 p.m.	N.N.E.	2	W. by S.	2	
April 1	8-0 a.m.	E.N.E.	1	N.W. by N.	0	
" 30	7-0 p.m.	S.	2	W.	1	
May 11	10-0 a.m.	W.S.W.	1	N.E.	1	
June 1	7-0 p.m.	N.E.	2	S.W.	1	
" 18	7-0 p.m.	N.W.	2	W.	2	W.
" 27	8-0 p.m.	W.	3	W.S.W.	2	S.W.
" 30	8-0 p.m.	W.	2	W.S.W.	0	W.
July 1	12-30 p.m.	N.W.	2	W. by S.	4	W.
" 1	3-30 p.m.	S.W.	1	W.	2	W. by S.
" 5	5-0 p.m.	S.W.	3	W.S.W.	4	W.S.W.
" 11	7-0 p.m.	S.E.	1	E. by N.	3	S.E.
" 18	5-30 p.m.	N.	1	W.	2	N.W.
" 25	7-15 a.m.	N.E.	1	N.E. by N.	1	
" 30	6-15 p.m.	E.	2	W. by N.	1	N.W.
August 10	5-45 p.m.	N.	2	W. by S.	1	N.W.
Sept. 10	3-0 p.m.	N.W.	2	W. by N.	2	N.W.
" 17	6-0 p.m.	N.W.	2	S.W.	1	N.W.
" 18	8-30 a.m.	S.W.	1	S.W. by W.	2	N.W.
" 25	3-0 p.m.	N.E.	2	S.W.	5	S.W.

OBSERVATIONS OF UPPER CLOUDS (*Continued*).

Date. 1892.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	Velocity (0—6)	Direction.	Force (0—12)	
October 7	2-20 p.m.	N.E.	1	W. by S.	2	S.W.
" 7	4-5 p.m.	N.E.	2	W.S.W.	1	S.W.
" 12	8-0 a.m.	N.E.	1	N.E. by N.	0	N.E.
" 17	9-0 a.m.	N.	1	N.	1	N.W.
" 19	2-0 p.m.	N.E.	2	W. by N.	3	S.W.
" 20	4-30 p.m.	.....	...	W.	1	W.
" 21	9-10 a.m.	S.W.	1	N.W. by N.	1	W.
" 22	10-7 a.m.	N.W.	1	N.W. by N.	4	W.
Nov. 1	10-0 a.m.	.....	...	N.E. by N.	1	
" 2	9-30 a.m.	E.	2	E.	1	S.E.
" 9	9-20 a.m.	N.W.	2	S.W.	1	S.E.
" 16	3-0 p.m.	W.	1	N.W. by W.	1	S.
" 18	9-45 a.m.	N.W.	2	N.N.E.	1	S.E.
Dec. 2	9-15 a.m.	N.	1	N.W. by N.	1	
" 6	10-45 a.m.	N.W.	2	N.W. by W.	1	
" 11	9-30 a.m.	N.	1	W.	2	W.
" 12	Noon.	N.	1	W.N.W.	3	N.W.
" 12	2-50 p.m.	N.W.	1	W.N.W.	3	N.W.
" 13	9-10 a.m.	N.	2	N.W.	1	
" 13	2-0 p.m.	N.W.	2	W.N.W.	1	
" 24	9-10 a.m.	S.W.	1	E. by S.	0	
" 24	11-0 a.m.	N.W.	2	E. by S.	1	
" 24	12-0 a.m.	N.W.	2	E. by S.	1	
" 25	10-0 a.m.	N.W.	1	E.	1	N.W.
" 28	9-0 a.m.	N.	1	E.N.E.	0	
" 30	9-5 a.m.	N.W.	1	S.S.E.	0	N.E.

# MONTHLY MAGNETICAL OBSERVATIONS

## TAKEN AT THE

### COLLEGE OBSERVATORY, STONYHURST, 1892.

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THE Horizontal, Vertical, and Total Forces are calculated to English measure; one foot, one second of mean solar time, and one grain being assumed as the units of space, of time, and of mass.

The Vertical and Total Forces are obtained from the absolute measures of the Horizontal Force, and of the Dip.

In the observations of Deflection and Vibration, taken each month for absolute measure of Horizontal Force, the same magnet has always been employed.

The moment of inertia of the magnet with its stirrup, for different degrees of temperature, and the co-efficients in the corrections required for the effects of temperature and of terrestrial magnetic induction on the magnetic moment of the magnet, were determined at the Kew Observatory by the late Mr. Welsh.

The moment of inertia of the magnet with its stirrup, using the grain and foot as the units of mass and of linear measure is 5.27303. Its rate of increase for increase of temperature is 0.00073 for every 10° of Fahr.

The weight of the magnet with its stirrup is approximately 825 grains, and the length of the magnet is nearly 3.94 inches. The moment of inertia was determined, independently of the weight and dimensions, by the method of vibration, with and without a known increase of the moment of inertia.

The temperature corrections have always been obtained from the formula  $q(t^\circ - 35^\circ + q'(t^\circ - 35^\circ)^2$ , where  $t^\circ$  is the observed temperature and 35° Fahr. the adopted standard temperature. The values of the co-efficient  $q$  and  $q'$  are respectively 0.0001128 and 0.000000436.

The induction co-efficient  $\mu$  is 0.000244.

The correction for error of graduation of the Deflection bar at 10 foot is  $+ 0.00004$  ft, at 1.3  $+ 0.000064$  ft.

The observed times of vibration are entered in the Table without corrections.

The time of one vibration has been obtained each month from the mean of twelve determinations of the time of 200 vibrations.

The angles of deflection are each the mean of two sets or readings.

In deducing from these observations the ratio and product of the magnetic moment  $m$  of the magnet, and the earth's horizontal magnetic intensity  $X$ , the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread; but no correction has been required for the rate of the chronometer, or for the arc of vibration, the former having been always under 1.5s and the latter never over 50'.

The average deflection of the magnet caused by a twist of the torsion circle through  $90^\circ$ , has been about 9.3 of arc.

In the calculations of the ratio  $\frac{m}{X}$ , the third and subsequent

terms of the series  $1 + \frac{P}{r^2} + \frac{Q}{r^4} + \&c.$ , have always been omitted.

The value of the constant  $P$  was found to be 0.00433.

The Declination observations have been taken once a week

## OBSERVATIONS OF DECLINATION AND DIP.

MONTH	G.M.T.	WEST DECLINATION		G.M.T.	DIP.
	CIVIL DAY	Observation.	Monthly Mean.	CIVIL DAY.	
	D. H. M.	° ' "	° ' "	D. H. M.	° ' "
Jan.	4 16 8	18 36 39	18 43 0	15 15 15	69 1 0
	11 16 8	18 37 4			
	19 16 8	19 0 54			
	25 16 8	18 37 24			
Feb.	3 16 13	18 39 9	18 43 18	15 15 10	69 2 46
	8 16 13	18 37 54			
	15 16 8	18 59 9			
	22 16 8	18 36 59			
March	2 16 8	18 50 4	18 51 11	14 12 23	69 8 5
	7 16 8	18 38 54			
	14 16 8	18 55 34			
	21 16 10	18 57 24			
April	28 16 8	18 53 59	18 46 10	15 16 23	69 1 47
	4 16 10	18 43 4			
	11 16 17	18 33 39			
	18 16 13	18 59 14			
May	25 16 8	18 48 44	18 50 37	22 17 32	69 7 37
	2 16 8	18 36 44			
	9 16 13	18 52 59			
	16 16 8	18 49 49			
June	23 16 13	18 54 39	18 50 18	15 18 8	68 58 8
	30 16 8	18 58 54			
	6 16 8	18 46 4			
	13 16 10	18 45 14			
	20 16 15	18 58 14			
	27 16 33	18 51 39			

## OBSERVATIONS OF DECLINATION AND DIP.

*(Continued.)*

MONTH.	G.M.T.	WEST DECLINATION		G.M.T.	DIP.
	CIVIL DAY	Observation.	Monthly Mean	CIVIL DAY.	
	D. H. M.	° ' "	° ' "	D. H. M.	° ' "
July	4 16 13	18 54 44	18 55 48	15 16 8	69 19 9
	12 16 13	18 55 24			
	18 16 16	18 56 14			
	25 16 15	18 56 49			
August	1 16 8	18 58 34	18 51 24	17 13 35	69 6 43
	9 16 23	18 55 59			
	16 15 42	18 30 49			
	22 16 8	18 57 34			
Sept.	30 16 8	18 54 4	18 55 44	15 11 35	69 7 22
	5 16 12	18 53 29			
	14 16 15	18 57 14			
	19 16 18	18 59 49			
Oct.	26 16 8	18 52 24	18 44 33	17 12 7	69 5 10
	4 16 8	18 54 24			
	10 16 18	18 26 14			
	17 16 10	18 52 59			
Nov.	24 16 13	18 44 34	18 39 6	18 10 28	69 12 30
	1 14 13	18 35 34			
	9 16 30	18 20 44			
	14 16 8	18 33 19			
Dec.	21 16 8	18 53 19	18 48 27	22 15 15	69 4 34
	28 16 18	18 52 34			
	4 16 13	18 40 19			
	12 16 13	18 44 29			
Yearly Mean	19 16 8	18 56 29	18 48 18		69 6 14
	27 16 8	18 52 29			

**OBSERVATIONS OF VIBRATIONS AND DEFLECTION  
FOR ABSOLUTE MEASURE OF MAGNETIC FORCE.**

Month.	G. M. T. (Civil Day).	Temp.	Time of one vibration.	G. M. T.	Temp.	Observed Deflection at 1·0 ft. at 1·3 ft.
	D. H. M.	°		D. H. M.	°	° ' "
Jan.	15 10 0	47·9	5·9570	15 { 11 35 12 20	39·3 40 0	12 11 21 5 31 36
Feb.	15 9 14	37·4	5·9575	15 { 10 25 11 15	40·1 40·1	12 14 12 5 33 19
Mar.	14 9 38	29·5	5·9614	14 { 10 46 11 15	38·3 39·8	12 13 12 5 32 17
Apr.	15 11 49	39·9	5·9601	15 { 14 46 15 10	50·2 47·5	12 13 13 5 33 53
May	21 11 8	53·3	5·9656	21 { 9 22 9 50	49·4 50 6	12 13 13 5 31 39
June	15 11 34	58·7	5·9720	15 { 14 22 14 48	61 7 62 0	12 7 25 5 29 52
July	15 9 43	54 9	5·9803	15 { 10 30 10 55	55·5 57·3	12 11 45 5 31 29
Aug.	17 11 12	64·9	5·9768	17 { 12 7 12 30	64·5 65·0	12 9 8 5 31 5
Sept.	15 9 17	55·0	5·9670	15 { 10 5 10 20	55·8 56·6	12 2 34 5 31 29
Oct.	17 9 17	46·2	5 9583	17 { 10 5 10 35	44·0 45·4	12 14 50 5 33 17
Nov.	16 10 30	47·9	5·9451	16 { 14 15 15 40	49·8 52·5	12 13 30 5 31 35
Dec.	22 11 15	42·4	5·9498	22 { 12 8 12 35	42·5 43·0	12 14 11 5 31 50



## MAGNETIC INTENSITY.

BRITISH UNITS.				C. G. S. UNITS.		
	X or horizontal force.	Y or vertical force.	Total Force.	X or Horizontal Force.	Y or Vertical Force.	Total Force.
Jan. ..	3·7114	9·6770	10·3643	0·1711	0·4462	0·4779
Feb. ..	3·7001	9·6623	10·3465	0·1706	0·4455	0·4771
Mar. ..	3·7004	9·7080	10·3894	0·1706	0·4476	0·4790
April ..	3·6949	9·6403	10·3241	0·1704	0·4445	0·4760
May ..	3·7046	9·7152	10·3976	0·1708	0·4479	0·4794
June ..	3·7110	9·6519	10·3407	0·1711	0·4450	0·4768
July ..	3·6961	9·7913	10·4658	0·1704	0·4515	0·4826
Aug. ..	3·7032	9·7040	10·3866	0·1708	0·4474	0·4789
Sept. ..	3·7051	9·7143	10·3969	0·1708	0·4479	0·4794
O&A. ..	3·7028	9·6897	10·3732	0·1707	0·4468	0·4783
Nov. ..	3·7169	9·7891	10·4711	0·1714	0·4514	0·4828
Dec. ..	3·7123	9·7094	10·3949	0·1712	0·4477	0·4793
Means	3·7049	9·7044	10·3876	0·1708	0·4475	0·4790

## DATES OF MAGNETIC DISTURBANCES.

The disturbances are divided into three classes, *small*, *moderate*, and *greater*; these are indicated by the initial letters of the classes, and the letter *c* denotes *calm*. The days are reckoned astronomically, from noon to noon. The asterisk signifies that the record was partly or wholly lost, according as it stands, with or without an initial letter.

MONTH.	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.
1	s	*	g	s	g	s	m	s	s	c	s	s
2	s	*	m	s	m	g	m	s	m	s	s	s
3	s	m	m	s	s	s	s	m	s	s	s	c
4	m	m	m	s	c	m	s	m	s	c	g	g
5	g	m	s	s	m	s	s	s	s	s	c	g
6	s	s	g	s	s	s	s	m	s	s	s	m
7	s	m	m	s	m	s	s	m	s	s	c	m
8	s	s	m	m	s	s	s	s	s	s	s	s
9	s	m	m	m	s	s	m	s	s	c	s	s
10	s	s	m	s	s	s	s	c	s	m	c	c
11	m	s	g	m	c	s	s	s	s	s	c	s
12	m	g	g	m	c	s	g	g	s	m	c	m
13	s	g	s	s	s	s	g	s	s	m	s	m
14	s	m	s	s	c	c	m	c	s	g	m	m
15	s	m	m	s	c	s	m	s	s	m	c	s
16	m	m	s	c	m	m	g	s	s	c	s	m
17	m	s	s	c	m	m	g	s	s	m	m	s
18	m	m	s	c	g	s	m	c	c	m	m	s
19	s	s	s	c	s	s	s	s	c	m	c	s
20	s	m	s	c	c	s	m	s	s	m	c	c
21	s	m	s	c	s	s	m	c	m	m	s	s
22	s	s	c	c	s	s	s	s	m	m	s	m
23	s	s	s	m	s	m	s	m	s	s	s	m
24	s	m	m	m	s	m	m	m	s	s	s	m
25	s	m	m	g	c	s	m	m	s	s	s	s
26	s	g	s	g	c	g	m	m	s	s	s	s
27	s	m	m	s	s	g	m	s	s	s	s	s
28	m	s	m	s	s	m	m	s	m	s	s	s
29	m	m	s	m	s	m	m	s	s	s	s	m
30	s		m	m	m	m	s	c	m	s	s	s
31	*		m		m		s	s		s	s	s
Totals.	s - - 21	9	12	13	14	18	13	17	23	16	19	16
{ m - - 8	8	15	14	8	7	8	14	8	5	10	3	10
{ g - - 1	1	3	4	2	2	3	4	1	0	1	1	2
{ c - - 0	0	0	1	7	8	1	0	5	2	4	8	3

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APPENDIX

RESULTS

OF

METEOROLOGICAL OBSERVATIONS

TAKEN AT

ST. IGNATIUS' COLLEGE, MALTA,

BY THE

REV. J. SCOLES, S.J.

1892.

# ST. IGNATIUS' COLLEGE, MALTA.

Lat.  $35^{\circ} 55'$  N.      Long.  $14^{\circ} 29'$  E.      Barometer Readings  
reduced to  $32^{\circ}$  F. at sea level.

## METEOROLOGICAL REPORT. 1892.

### JANUARY.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer ....inches 29·978	30·051
Highest                    „            on the 31st            „            30·352	30·415
Lowest                    „            on the 14th            „            29·576	29·538
Range of Barometer Readings ..... 0·776	0·877
Highest Reading of a Max. Therm. on the 12th 68·4	63·9
Lowest Reading of a Min. Therm. on the 30th 44·0	41·6
Range of Thermometer Readings ..... 24·4	22·3
Greatest Range in 24 hours on the 8th ..... 17·0	18·4
Mean of all the Highest Readings ..... 62·1	58·4
Mean of all the Lowest Readings ..... 50·5	47·8
Mean Daily Range ..... 11·6	10·6
Mean Temperature (deduced from Max. & Min) 55·6	52·5
Mean Temperature (deduced from Dry Bulb) 55·0	52·1
Adopted Mean Temperature..... 55·3	52·3
Mean Temperature of Evaporation ..... 51·2	48·1
Mean Temperature of Dew Point ..... 48·7	44·9
Mean elastic force of Vapour .....inches 0·344	0·298
Mean weight of Vapour in a cub. ft. of air grains 3·9	3·4
Mean additional weight required for saturation „ 0·8	0·9
Mean degree of Humidity ..... 83	80
Mean weight of a cubic foot of air ..grains 538·4	542·9
Fall of Rain .....inches 3·232	3·329
Number of days on which Rain fell..... 10	12
Mean amount of Cloud (an overcast sky=10) 4·3	4·6
Total number of miles of Wind indicated.... 8340	8336
Mean Velocity of Wind per hour .....miles 11·2	11·2

## FEBRUARY.

Results of Observations taken during the month.	Mean for the last 5 years.
Mean Reading of the Barometer .....inches29·933	30·064
Highest                   ,,                   on the 1st   ,,   30·210	30·334
Lowest                   ,,                   on the 4th   ,,   29·534	29·690
Range of Barometer Readings .....,,   0·676	0·644
Highest Reading of a Max. Therm. on the 19th 68·2	67·0
Lowest Reading of a Min. Therm. on the 5th 45·0	42·0
Range of Thermometer Readings..... 23·2	25·0
Greatest Range in 24 hours on the 19th ..... 19·6	18·8
Mean of all the Highest Readings ..... 61·6	60·7
Mean of all the Lowest Readings..... 51·8	49·0
Mean Daily Range ..... 9·8	11·7
Mean Temperature (deduced from Max. & Min.) 55·7	53·9
Mean Temperature (deduced from Dry Bulb) 56·2	54·0
Adopted Mean Temperature ..... 55·9	54·0
Mean Temperature of Evaporation ..... 52·5	50·0
Mean Temperature of Dew Point..... 50·5	47·3
Mean elastic force of Vapour .....inches 0·367	0·327
Mean weight of Vapour in a cubic ft. of air grains 4·2	3·7
Mean additional weight required for saturation ,, 0·6	0·8
Mean degree of Humidity ..... 86	83
Mean weight of a cubic foot of air.....grains 536·7	541·1
Fall of Rain .....inches 1·180	1·483
Number of days on which Rain fell..... 10	9
Mean amount of cloud (an overcast sky=10.... 5·7	4·0
Total number of miles of Wind indicated.... 8347	6893
Mean Velocity of Wind per hour .....miles 12·0	10·1

## MARCH.

Result of Observations taken during the Month.	Mean for the last 5 years
Mean Reading of the Barometer .....inches 29·970	30·008
Highest                   ,,       on the 23rd       ,,   30·275	30·404
Lowest                   ,,       on the 29th       ,,   29·574	29·513
Range of Barometer Readings ..... 0·701	0·891
Highest Reading of a Max. Therm. on the 14th 70·8	74·6
Lowest Reading of a Min. Therm. on the 20th 44·9	44·2
Range of Thermometer Readings ..... 25·9	30·4
Greatest Range in 24 hours on the 24th.... 19·6	23·4
Mean of all the Highest Readings ..... 63·9	63·6
Mean of all the Lowest Readings ..... 51·8	51·2
Mean Daily Range ..... 12·1	12·4
Mean Temperature (deduced from Max & Min. 57·2	51·6
Mean Temperature (deduced from Dry Bulb) 55·8	56·0
Adopted Mean Temperature..... 56·5	56·3
Mean Temperature of Evaporation..... 52·5	52·5
Mean Temperature of Dew Point ..... 49·6	49·4
Mean elastic force of Vapour .....inches 0·357	0·354
Mean weight of Vapour in a cub. ft. of air grains 4·0	4·0
Mean additional weight required for saturation ,, 1·0	1·0
Mean degree of Humidity ..... 81	80
Mean weight of a cubic foot of air .... grains 536·5	536·7
Fall of Rain .....inches 0·810	0·692
Number of days on which Rain fell..... 5	6
Mean amount of Cloud (an overcast sky=10) 4·4	4·2
Total number of miles of wind indicated.... 8101	7886
Mean velocity of wind per hour ..... miles 10·9	10·6

## APRIL.

Results of Observations taken during the Month.	Mean for the last 5 years.
Mean Reading of the Barometer .....inches 29·907	29·930
Highest                   ,,       on the 24th       ,,   ..30·802	30·246
Lowest                   ,,       on the 29th       ,,   ..29·536	29·460
Range of Barometer Readings ..... 0·766	0·786
Highest Reading of a Max. Therm. on the 25th 72·5	75·1
Lowest Reading of a Min. Therm. on the 21st 49·9	47·9
Range of Thermometer Readings..... 22·6	27·2
Greatest Range in 24 hours on the 25th ..... 21·1	20·9
Mean of all the Highest Readings ..... 65·8	67·5
Mean of all the Lowest Readings..... 55·5	54·2
Mean Daily Range ..... 10·3	13·3
Mean Temperature (deduced from Max & Min) 59·6	59·8
Mean Temperature (deducted from Dry Bulb) 59·6	59·8
Adopted Mean Temperature..... 59·6	59·8
Mean Temperature of Evaporation..... 56·3	55·9
Mean Temperature of Dew Point..... 53·4	52·3
Mean elastic force of Vapour..... inches 0·409	0·393
Mean weight of Vapour in a cub. ft. of air grains 4·6	4·4
Mean additional weight required for saturation ,, 1·2	1·4
Mean degree of Humidity ..... 81	77
Mean weight of a cubic foot of air .. grains 530·5	530·6
Fall of Rain ..... inches 2·321	0·606
Number of days on which Rain fell..... 9	5
Mean amount of Cloud (an overcast sky=10) 5·3	4·0
Total number of miles of Wind indicated .... 9312	7869
Mean Velocity of Wind per hour.....miles 12 9	10·9

## MAY.

Results of Observations taken during the Month.		Mean for the last 10 years.
Mean Reading of the Barometer .....	inches 30.002	29.991
Highest .....	on the 29th ,, 30.199	30.180
Lowest .....	on the 3rd ,, 29.520	29.614
Range of Barometer Readings .....	,, 0.679	0.566
Highest Reading of a Max. Therm. on the 23rd	83.2	82.6
Lowest Reading of a Min. Therm. on the 4th	53.2	53.9
Range of Thermometer Readings .....	30.0	28.7
Greatest Range in 24 hours on the 23rd .....	25.2	24.1
Mean of all the Highest Readings .....	71.9	72.6
Mean of all the Lowest Readings .....	58.1	58.4
Mean Daily Range .....	13.8	14.2
Mean Temperature (deduced from Max and Min)	64.0	64.3.
Mean Temperature (deduced from Dry Bulb.)	63.0	63.8
Adopted Mean Temperature .....	63.5	64.1
Mean Temperature of Evaporation .....	59.7	60.0
Mean Temperature of Dew Point .....	56.5	56.4
Mean elastic force of Vapour .....	inches 0.457	0.456
Mean weight of Vapour in a cub. ft. of air grains	5.0	5.0
Mean additional weight required for saturation,,	1.5	1.7
Mean degree of Humidity .....	78	75
Mean weight of a cubic foot of air....grains	528.0	527.1
Fall of Rain .....	inches 3.232	1.249
Number of days on which Rain fell .....	5	4
Mean amount of Cloud (an overcast sky =10)	4.2	3.1
Total number of miles of Winds indicated....	7515	7372
Mean Velocity of Wind per hour.....miles	10.1	9.9



## JUNE.

Results of Observations taken during the Month.	Mean for the last 10 years.
Mean Reading of the Barometer ....inches 30·018	30·009
Highest                   ,,           on the 22nd   ,,   30·129	30·175
Lowest                   ,,           on the 10th   ,,   29·867	29·882
Range of Barometer Readings.....,,   0·262	0·243
Highest Reading of a Max. Therm. on the 25th 91·8	91·0
Lowest Reading of a Min. Therm. on the 4th 60·1	59·2
Range of Thermometer Readings ..... 31·7	31·8
Greatest range in 24 hours on the 4th ..... 26·1	25·7
Mean of all the Highest Readings ..... 82·4	80·6
Mean of all the Lowest Readings ..... 65·7	64·8
Mean Daily Range ..... 16·7	15·8
Mean Temperature (deduced from Max. & Min) 72·1	71·9
Mean Temperature (deducted from dry bulb) 73·3	71·2
Adopted Mean Temperature..... 72·7	71·6
Mean Temperature of Evaporation..... 66·8	65·9
Mean Temperature of Dew Point..... 62·4	61·7
Mean elastic force of Vapour.....inches 0·564	0·550
Mean weight of Vapour in a cub. ft. of air grains 6·1	6·0
Mean additional weight required for saturation ,, 2·6	2·4
Mean degree of Humidity ..... 70	70
Mean weight of a cubic foot of air ..grains 518·7	519·6
Fall of Rain .....inches 0·010	0·081
Number of Days on which rain fell ..... 1	1
Mean amount of Cloud (an overcast sky =10) 1·9	2·0
Total number of miles of Wind indicated .... 5872	6213
Mean Velocity of Wind per hour .....miles 8·2	8·7

JULY.

Results of Observations taken during the Month.		Mean for the last 10 years.
Mean Reading of the Barometer .....	inches 29·998	30·012
Highest	„ on the 5th „ 30·195	30·155
Lowest	„ on the 12th „ 29·801	29·844
Range of Barometer Readings.....	„ 0·394	0·311
Highest Reading of Max. Therm. on the 12th	95·4	97·2
Lowest Reading of Min. Therm. on the 22nd	66·3	64·6
Range of Thermometer Readings.....	29·1	32·6
Greatest Range in 24 hours on the 31st .....	24·8	26·8
Mean of all the Highest Readings .....	86·4	86·8
Mean of all the Lowest Readings .....	70·8	69·8
Mean Daily Range .....	15·6	17·0
Mean Temperature (deduced from Max & Min.)	78·1	77·8
Mean Temperature (deduced from dry bulb)	76·7	76·8
Adopted Mean Temperature.....	77·4	77·3
Mean Temperature of Evaporation .....	70·6	70·2
Mean Temperature of Dew Point .....	66·0	65·3
Mean elastic force of Vapour .....	inches 0·639	0·625
Mean weight of Vapour in a cub. ft. of air grains	6·9	6·7
Mean additional weight required for saturation,,	3·2	5·4
Mean degree of Humidity .....	69	67
Mean weight of a cubic foot of air ....	grains 513·2	513·8
Fall of Rain .....	inches 0·407	0
Number of days on which Rain fell .....	1	0
Mean amount of Cloud (an overcast sky=10)	0·9	0·6
Total number of miles of Wind indicated ....	6637	5600
Mean Velocity of Wind per hour.....	miles 8·9	7·6

## AUGUST.

Results of Observations taken during the Month.	Mean for the last 10 years.
Mean Reading of the Barometer .....inches 30·022	30·010
Highest                   ,,           on the 16th       ,,   30·192	30·156
Lowest                   ,,           on the 2nd       ,,   29·855	29·868
Range of Barometer Readings .....   ,,   0·237	0·293
Highest Reading of a Max. Therm. on the 1st 99·2	97·0
Lowest Reading of a Min. Therm. on the 10th 67·8	66·2
Range of Thermometer Readings..... 31·9	30·8
Greatest Range in 24 hours on the 1st ..... 25·8	26·2
Mean of all the Highest Readings ..... 87·4	87·3
Mean of all the Lowest Readings..... 71·2	71·1
Mean Daily Range ..... 16·2	16·2
Mean Temperature (deduced from Max.& Min.) 78·5	78·4
Mean Temperature (deduced from Dry Bulb) 78·3	78·4
Adopted Mean Temperature ..... 78·4	78·4
Mean Temperature of Evaporation ..... 71·7	71·4
Mean Temperature of Dew Point ..... 67·0	66·7
Mean elastic force of Vapour ..... inches 0·661	0·653
Mean weight of Vapour in a cub. ft. of air grains 7·1	7·0
Mean additional weight required for saturation ,, 3·4	3·5
Mean degree of Humidity ..... 68	67
Mean weight of a cubic foot of air.....grains 512·1	512·2
Fall of Rain ..... inches ...	..
Number of days on which Rain fell..... ...	..
Mean amount of Cloud (an overcast sky=10.. 0·9	1·0
Total number of miles of Wind indicated.... 4868	5442
Mean Velocity of Wind per hour .....miles 6·5	7·3

mean Daily Range .....	13.5	14.1
Mean Temperature (deduced from Max & Min )	73.5	74.7
Mean Temperature (deduced from Dry Bulb)	72.7	74.5
Adopted Mean Temperature.....	73.1	74.6
Mean Temperature of Evaporation.....	67.8	68.9
Mean Temperature of Dew Point .....	64.1	64.8
Mean elastic force of Vapour ....inches	0.598	0.615
Mean weight of Vapour in a cub. ft. of air grains	6.5	6.7
Mean additional weight required for saturation „	2.4	2.6
Mean degree of Humidity .....	75	72
Mean weight of a cubic foot of air grains	518.3	517.3
Fall of rain .....	inches 3.280	1.375
Number of Days on which rain fell.....	7	5
Mean amount of Cloud (an overcast sky=10)..	2.5	2.4
Total number of miles of Wind indicated ....	5564	5630

## OCTOBER.

Results of Observations taken during the Month.	Mean for the last 10 years
Mean Reading of the Barometer .....inches 30·028	30·045
Highest                   ,,                   on the 28th   ,,   30·231	30·274
Lowest                   ,,                   on the 21st   ,,   29·728	29·727
Range of Barometer Readings.....,   0·503	0·547
Highest Reading of a Max. Therm. on the 2nd   89·8	87·4
Lowest Reading of a Min. Therm. on the 23rd   58·1	55·7
Range of Thermometer Readings .....   31·7	31·7
Greatest Range in 24 hours on the 2nd .....   19·2	19·6
Mean of all the Highest Readings .....   78·3	76·1
Mean of all the Lowest Readings.....   66·2	64·3
Mean Daily Range .....   12·1	11·8
Mean Temperature (deduced from Max. & Min)   71·3	69·3
Mean Temperature (deduced from Dry Bulb)   69·7	68·4
Adopted Mean Temperature .....   70·5	68·9
Mean Temperature of Evaporation .....   66·3	64·2
Mean Temperature of Dew Point .....   63·7	60·7
Mean elastic force of Vapour .....inches 0·590	0·536
Mean weight of Vapour in a cub. ft. of air grains   6·5	5·8
Mean additional weight required for saturation ,,   1·4	1·7
Mean degree of Humidity .....   82	77
Mean weight of a cubic foot of air .. grains 521·4	523·4
Fall of Rain ..... ..inches 1·658	3·013
Number of days on which Rain fell .....   8	8
Mean amount of Cloud (an overcast sky=10)   4·7	4·2
Total number of miles of Wind indicated..... 5711	6802
Mean Velocity of Wind per hour.....miles   7·7	9·2

## NOVEMBER.

Results of Observations taken during the Month.		Mean for the last 10 years.
Mean Reading of the Barometer ....inches	30·124	30·076
Highest                   ,,                   on the 30th   ,,	30·355	30·328
Lowest                   ,,                   on the 18th   ,,	29·843	29·746
Range of Barometer Readings ..   ,,	0·512	0·582
Highest Reading of a Max. Therm. on the 2nd	81·6	76·1
Lowest Reading of a Min. Therm. on the 30th	47·6	49·0
Range of Thermometer Readings .....	34·0	27·1
Greatest Range in 24 hours on the 30th ....	17·1	18·5
Mean of all the Highest Readings.....	69·4	68·0
Mean of all the Lowest Readings .....	58·7	56·9
Mean Daily Range .....	10·7	11·1
Mean Temperature (deduced from Max. & Min.)	63·0	61·7
Mean Temperature (deduced from Dry Bulb)	62·0	61·2
Adopted, Mean Temperature.....	62·5	61·5
Mean Temperature of Evaporation .....	57·9	56·9
Mean Temperature of Dew Point .....	55·0	53·8
Mean elastic force of Vapour .....inches	0·433	0·414
Mean weight of Vapour in a cub. ft. of air grains	4·8	4·7
Mean additional weight required for saturation,,	1·2	1·3
Mean degree of Humidity .....	80	79
Mean weight of a cubic foot of air.... grains	532·5	532·6
Fall of Rain .....	inches 7·329	3·305
Number of days on which Rain fell .....	13	10
Mean amount of Cloud (an overcast sky=10)	5·2	4·8
Total number of miles of Wind indicated ....	6587	6809
Mean Velocity of Wind per hour.....miles	9·1	9·5

## DECEMBER.

Results of Observations taken during the Month.	Mean for the last 10 years.
Mean Reading of the Barometer .... inches 30·012	30·070
Highest ,, ,, on the 18th ,, 30·447	30·414
Lowest ,, ,, on the 31st ,, 29·336	29·582
Range of Barometer Readings.....,, 1·111	0·832
Highest Reading of a Max. Therm. on the 9th 69·9	68·5
Lowest Reading of a Min. Therm. on the 8th 48·7	44·0
Range of Thermometer Readings ..... 21·2	24·5
Greatest Range in 24 hours on the 8th ..... 17·3	17·2
Mean of all the Highest Readings ..... 64·9	62·0
Mean of all the Lowest Readings ..... 54·6	52·2
Mean Daily Range ..... 10·8	9·8
Mean Temperature (deduced from Max & Min). 59·0	56·5
Mean Temperature (deduced from Dry Bulb) 58·1	56·0
Adopted Mean Temperature ..... 58·6	56·3
Mean Temperature of Evaporation..... 53·8	51·9
Mean Temperature of Dew Point ..... 50·7	48·7
Mean elastic force of Vapour ..... inches 0·370	0·344
Mean weight of Vapour in a cub. ft. of air grains 4·1	3·9
Mean additional weight required for saturation,, 1·2	1·1
Mean degree of Humidity..... 79	79
Mean weight of a cubic foot of air .... grains 535·2	538·8
Fall of rain ..... inches 2·069	3·653
Number of Days on which Rain fell ..... 13	14
Mean amount of Cloud (an overcast sky=10) 6·0	5·4
Total number of miles of Wind indicated .... 7844	8291
Mean Velocity of Wind per hour.....miles 10·5	11·2

## Summary of Observations

### FOR 1892.

Results of Observations taken during the Year.	Mean for the last 10 years.
Mean Reading of the Barometer .....inches 29·920	30·016
Highest           ,,   on December 18th   ,,   30·447	30·505
Lowest           ,,   on December 31st   ,,   29·336	29·354
Range of Barometer Readings .....   ,,   1·111	1·151
Highest Reading of a Max. Therm. on Aug. 1st 99·2	99·3
Lowest Reading of a Min. Therm. on Jan. 30th 44·0	40·9
Range of Thermometer Readings ..... 55·2	58·4
Greatest Range in 24 hours on Sept. 4th .... 26·5	28·9
Mean of all the Highest Readings ..... 72·9	72·4
Mean of all the Lowest Readings ..... 60·2	59·2
Mean Daily Range ..... 12·7	13·2
Mean Temperature (deduced from Max & Min.) 65·6	64·9
Mean Temperature (deduced from Dry Bulb) 65·0	64·4
Adopted Mean Temperature ..... 65·3	64·7
Mean Temperature of Evaporation ..... 60·6	59·7
Mean Temperature of Dew Point..... 57·3	56·0
Mean elastic force of Vapour..... inches 0·470	0·449
Mean weight of Vapour in a cubic foot of air grains 5·3	5·1
Mean additional weight required for saturation ,, 1·7	1·8
Mean degree of Humidity..... 78	76
Mean weight of a cubic foot of air ....grains 526·8	528·0
Total fall of rain in the Year..... inches 25·528	19·204
Number of Days on which Rain fell..... 81	76
Mean amount of Cloud (an overcast sky=10).. 3·9	3·5
Total number of miles of Wind indicated .... 84698	84749
Mean Velocity of Wind per hour.....miles 9·6	9·7

The Maximum monthly mean height of the Barometer was  
in November, 1889, and was .....inches 30·249  
The Minimum   ,,   ,,   in January, 1886, and was   ,, 29·844



The Maximum yearly mean height of the Barometer was in 1884, and was.....	inches	30·057
The Minimum „ „ in 1885, and was.....	„	30·009
The greatest monthly range of the Barometer was in January, 1886, and was .....		1·201
The least „ „ in August, 1883, and was .....		0·188
The highest reading of the Barometer, during 5 years, was on January 26th, 1887, and was .....		30·627
The lowest „ „ on the 17th, January 1886, and was .....		29·155
Extreme range .....		1·472
The highest temperature was on July 20th, 1889, and was..		104·1
The lowest „ „ February 20th, 1891..		37·7
The highest mean temperature of a month was in August, 1885, and was .....		83·2
The lowest „ „ February, 1891, and was .....		49·5
The greatest monthly mean weight of vapour, in a cubic foot of air was in August, 1855, and was... ..	grains	7·9
The least „ „ January and February, 1891, and was „		3·0
The highest observed Dew-point was on the 30th August, 1885, and was .....		78·7
The lowest „ „ 19th January, 1891, and was .....		28·6
The greatest fall of rain in a month, was in December, 1889, and was .....	inches	8·952
The greatest number of days on which rain fell in one month was in January, 1889 .....	days	24
The highest temperature registered in sunshine was on the 20th July, 1889, and was .....		158·8
The lowest temperature registered on ground was on the 25th January, 1891, and was .....		32·5
The highest observed sea temperature was on the 5th August, 1887, and was .....		85·0
The lowest „ „ 23rd January, 1891, and was .....		56·0
The smallest mean amount of cloud observed in one month was in August, 1890, and was .....		0·0
The greatest „ „ in December, 1888, and was .....		6·4

## NOTES FOR THE SEPARATE MONTHS.

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### JANUARY.

THE Dew-point ranged between  $39.9^{\circ}$  on the 10th and  $55.2^{\circ}$  on the 20th.

In Sunshine, the highest reading was  $116.4^{\circ}$  on the 12th.

On ground, the lowest reading was  $38.2^{\circ}$  on the 11th.

The Sea has fallen from  $61.5^{\circ}$  to  $58.6^{\circ}$ .

Thunderstorms passed on the 25th and 26th.

Lightning was seen on the 14th.

Total Rainfall since last June 10.496 inches ;

the average of 5 years, 15.362 inches.

### FEBRUARY.

The Dew-point ranged between  $36.1^{\circ}$  on the 15th &  $57.8^{\circ}$  on the 28th.

In Sunshine, the highest reading was  $123.4^{\circ}$  on the 29th.

On Ground, the lowest reading was  $39.0^{\circ}$  on the 12th.

The Sea has risen from  $58.6^{\circ}$  to  $61.0^{\circ}$ .

Lightning was seen on the 23rd.

Total Rainfall since last June, 11.676 inches

the average of 5 years, 16.845 inches.

### MARCH.

The Dew-point ranged between  $57.0^{\circ}$  on the 10th and  $41.0^{\circ}$  on the 11th.

In Sunshine, the highest reading was  $129.4^{\circ}$  on the 14th.

On Ground, the lowest reading was  $38.0^{\circ}$  on the 23rd.

The Sea has fallen from  $61.0^{\circ}$  to  $59.8^{\circ}$ .

Lightning was seen on the 30th.

Total Rainfall since last June 12.486 inches ;

the average of 5 years, 17.537 inches.

## APRIL.

The Dew-point ranged between  $59.4^{\circ}$  on the 14th and  $87.0^{\circ}$  on the 20th.

In Sunshine, the highest reading was  $131.6^{\circ}$  on the 27th.

On Ground, the lowest reading was  $43.5^{\circ}$  on the 24th.

The Sea has risen from  $59.8^{\circ}$  to  $62.5^{\circ}$ .

Thunderstorms passed on the 2nd, 4th, and 21st.

Hail fell on the 2nd, 20th, and 21st.

Total Rainfall since last June 14.807 inches ;

the average of 5 years, 18.148 inches.

## MAY.

The Dew-point ranged between  $46.0^{\circ}$  on the 8th and  $64.7^{\circ}$  on the 28th.

In Sunshine, the highest reading was 138.8 on the 23rd.

On Ground, the lowest reading was  $46.7^{\circ}$  on the 4th.

The Sea has risen from  $62.5^{\circ}$  to  $72.0^{\circ}$ .

Total Rainfall since last June 18.089 inches ;

the average of 5 years, 18.416 inches.

The rainfall is the same as that for the month of January, but it fell in half the number of days

## JUNE.

The Dew-point ranged between  $51.8^{\circ}$  on the 4th and  $70.8^{\circ}$  on the 30th.

In Sunshine, the highest reading was  $147.1^{\circ}$  on the 25th.

On Ground, the lowest reading was  $54.8^{\circ}$  on the 4th.

The Sea has risen from  $72.0^{\circ}$  to  $77.0^{\circ}$ .

Lightning was seen on the 15th.

## JULY,

The Dew-point ranged between  $57.6^{\circ}$  on the 11th and  $72.8^{\circ}$  on the 18th.

In Sunshine, the highest reading was  $146.5^{\circ}$  on the 31st.

On Ground, the lowest reading was  $61.7^{\circ}$  on the 26th.

The Sea has risen from  $77.0^{\circ}$  to  $80.0^{\circ}$ .

Thunderstorms passed on the 21st.

## AUGUST.

Dew-point ranged between  $58.3^{\circ}$  on the 1st and  $71.8^{\circ}$  on the 17th.

In Sunshine, the highest reading was  $153.7^{\circ}$  on the 2nd.

On Ground, the lowest reading was  $61.4^{\circ}$  on the 5th.

The Sea rose to  $82.2^{\circ}$ .

Lightning was seen on the 22nd and 27th.

## SEPTEMBER.

Dew-point ranged between  $72.5^{\circ}$  on the 2nd and  $53.9^{\circ}$  on the 4th.

In Sunshine, the highest reading was  $144.5^{\circ}$  on the 4th.

On Ground, the lowest reading was  $58.4^{\circ}$  on the 29th.

The Sea has fallen from  $82.0^{\circ}$  to  $76.8^{\circ}$ .

Thunderstorms passed on the 9th, 10th, 21st, 22nd, 23rd, and 26th.

Lightning was seen on the 11th, 13th, 14th, 20th, and 24th.

Total Rainfall since last June 3.687 inches;

the average of 10 years 1.525 inches.

## OCTOBER.

Dew-point ranged between  $73.2^{\circ}$  on the 2nd and  $51.6^{\circ}$  on the 23rd.

In Sunshine, the highest reading was  $142.5^{\circ}$  on the 3rd.

On Ground, the lowest reading was  $52.8^{\circ}$  on the 23rd.

The Sea has fallen from  $76.8^{\circ}$  to  $73.0^{\circ}$

Thunderstorms passed on the 15th and 24th.

Lightning was seen on the 9th, 14th, 18th, 20th and 23rd.

Total Rainfall since last June 5.345 inches, the average of 10 years 4.537 inches.

## NOVEMBER.

Dewpoint ranged between  $68.9^{\circ}$  on the 2nd and  $41.9^{\circ}$  on the 30th.

In Sunshine, the highest reading was  $131.3^{\circ}$  on the 2nd.

On Ground, the lowest reading was  $41.0^{\circ}$  on the 30th.

The Sea has fallen from  $73.0^{\circ}$  to  $66.4^{\circ}$ .

Thunderstorms passed on the 10th, 11th, and 15th.

Lightning was seen on the 18th.

Total Rainfall since last June 12·674 inches ;

the average of 5 years 7·842 inches.

The rainfall is double the average for the month.

#### DECEMBER.

Dew-point ranged between  $38\cdot8^{\circ}$  on the 7th and  $58\cdot9^{\circ}$  on the 28th.

In Sunshine, the highest reading was  $117\cdot0^{\circ}$  on the 3rd.

On Ground, the lowest reading was  $43\cdot0^{\circ}$  on the 8th.

The Sea has fallen from  $66\cdot4^{\circ}$  to  $64\cdot0^{\circ}$ .

Thunderstorms passed on the 14th and 28th.

Hail fell on the 14th and 28th.

Total Rainfall since last June 14·743 inches ;

the average of 10 years, 11·495.

#### NOTES FOR THE YEAR.

Dew-point ranged between  $36\cdot1^{\circ}$  on the 15th February, and  $73\cdot2^{\circ}$  on the 2nd October.

In Sunshine, the highest reading was  $153\cdot7^{\circ}$  on the 2nd August.

On Ground, the lowest reading was  $38\cdot0^{\circ}$  on the 23rd March.

The Sea has ranged from  $58\cdot6^{\circ}$  in February to  $82\cdot0^{\circ}$  in August.

Thunderstorms passed on 22 days.

Lightning was seen on 17 days.

Hail fell on 5 days.

---

I have just finished an examination of the barometric waves during the last ten years, which I have carried on in the hopes that the result might throw some light on the three day period, popularly attributed to the gales of wind here, and very frequently verified in fact. I also expected to find a difference between the Summer and Winter behaviour of the barometer, and I think I have succeeded in both. I have reckoned the waves from Minimum to Minimum from a tabulation of the 8 a.m., and 8 p.m.

readings, but eliminating movements or dips of less than one-tenth inch deep. The results are as follows:—

		Length in Days.	Height in inches.	Rate of Motion in inches per diem.
	January	.. 6.8	0.400	0.135
	February	.. 5.2	0.326	0.127
	March	.. 6.0	0.379	0.128
	April	.. 4.7	0.308	0.133
SUMMER.	May	.. 6.4	0.268	0.080
	June	.. 6.4	0.192	0.059
	July	.. 7.3	0.180	0.050
	August	.. 7.9	0.171	0.043
	September	.. 8.5	0.237	0.059
	October	.. 6.7	0.290	0.092
	November	.. 5.8	0.276	0.096
	December	.. 6.4	0.371	0.124
	Mean for Year	6.5	0.283	0.097
	Summer	.. 7.2	0.223	0.064
	Winter	.. 5.7	0.387	0.124

From this it appears that the depressions average  $6\frac{1}{2}$  days in passing, and the winds of one side may be expected to come near averaging 8 days in duration or sufficiently so to attract notice to the period. Very frequently we have only the winds belonging to one side of a depression, and generally it is the rising side that is windy. Comparing Summer half with Winter half, there is considerable contrast to be seen. The Summer depressions average 1.7 day more in length and 0.16 inch less in depth than the Winter ones, so that the motion of the barometer is twice as lively in the Winter half. April is a remarkable month for short period. In Summer, especially in June and July, when the weather is very fine, there is a constant difference between 8 a.m. and 8 p.m. reading of from 3 to 5 hundredths of an inch in favour of the morning reading, the result of diurnal variation. This is seldom seen in Winter or indeed after August.

JAMES SCOLES, S.J.







*With*







STONYHURST COLLEGE  
OBSERVATORY.

RESULTS  
OF  
METEOROLOGICAL, MAGNETICAL,  
AND  
SOLAR OBSERVATIONS

BY THE  
REV. W. SIDGREAVES, S.J., F.R.A.S.

1893.

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## INTRODUCTION.

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The routine work of the meteorological and magnetical department of the observatory has been carried on under the same direction, and on the same lines as described in the introduction to the report of last year ; and special meteorological reports have been occasionally sent to personal applications.

The scale co-efficient of the Bifilar magnetograph was tested in October, and found to have suffered no change since its adjustment to 0·00050 C.G.S. units in March, 1892.

The year in general has been meteorologically a memorable one as a warm and dry year. But the long drought which affected the farming interest over the greater part of Europe, and the southern and midland counties of England, was only partially felt at Stonyhurst ; and it is remarkable that the total rainfall of the 12 months is in excess of the average by over three inches. Eight heavy storms in the four months following July contributed  $10\frac{1}{2}$  inches of rain to the unexpected total. The dry season commenced abruptly on the 18th of March, and lasted to the 22nd of June.

But it was broken with light showers in April, and on the first days of May and June; and the fall in May was brought up to the average by thundry rains in the third week, and on the 29th. The higher monthly mean temperature was maintained from March to August inclusively, at an average of nearly  $3^{\circ}$  above the general mean for the same period. September and October were colder, and December was a mild month.

The mean annual temperatures for the last 46 years are given at the end of the meteorological report, page 40, plotted on a chart; and a smooth mean wave curve of the whole period is drawn through the series. The complete period of this wave appears to be about 32 or 33 years, and the epochs of its maximum and minimum are approximately coincident with those of the great November meteor swarm, the Leonids.

The ordinary work of the solar chromosphere has been practically suspended during the year on account of the anticipated dismounting of the telescope for the erection of the Fr. Perry Memorial. But the Sun-spot drawings have been continued, and were carried on with the six inch objective—Alvan Clark—which was mounted on the Equatorial during the absence of parts of the eight inch telescope.

The new objective, with its mountings, arrived at the beginning of November, and was erected on the 6th. It has a clear aperture of  $14\frac{7}{8}$  inches, and was worked by Sir Howard Grubb, of Dublin. It is valued at £650, and constitutes the substantial tribute to the memory of the late Fr. Perry, raised by the generosity of his many friends. The general appearance of the instrument has been an agreeable surprise. The greater telescope appears better suited to the massive pedestal of the equatorial than the smaller one it was

built to carry ; and a remark made by the late Sir George Airey in 1866, while the instrument was still in the keeping of the Royal Astronomical Society—that it was worthy of a better object glass—has been more than confirmed by its manner of bearing the heavier load. We are not yet able to speak by experience of the excellence of the glass. The bright wintry nights have so far been attended with that optical quivering which reduces the greatest atmospheric transparency to a rank, in the order of observing excellence, inferior to a hazy sky. The severest tests of superior definition have therefore been impossible but occasional glimpses through momentarily steady air have given us an assurance that the objective will prove its constructor's verdict of excelling amongst the best.

The large grating spectograph has been employed upon the solar spots and faculae with the result of 175 photographs of spot-spectra in the green-yellow region, and 92 plates of faculae-reversals of the H and K lines.

The night-work with the Equatorial has been confined to stellar photographic spectra ; the intention being to continue the series of at least one good plate per annum of each of the brighter stars. But the series was interrupted in May, when it was decided to make use of every opportunity upon the variable star  $\beta$  Lyrae ; and as the exposures upon this were necessarily long, and there were many failures, the brightest stars were let alone. Out of the whole number of exposures, 45 plates proved to be available for careful measurements, and the results are published in the December number of the Monthly Notices of the Royal Astronomical Society.

WALTER SIDGREAVES, S.J., F.R.A.S.

# Stonyhurst Observatory.

Lat.  $53^{\circ} 50' 40''$  N. Long. 9m. 52s. 68 w. Height of the Barometer  
above the sea 381ft.

## METEOROLOGICAL REPORT.

JANUARY, 1893.

Results of Observations taken during the Month.		Mean for the last 46 years.
Mean Reading of the Barometer .....	29·617	29·442
Highest                   ,,           on the 4th   ,,	30·129	30·282
Lowest                   ,,           on the 29th   ,,	28·864	28·581
Range of Barometer Readings .....	1·265	1·701
Highest Reading of a Max. Therm. on the 30th	52·1	51·5
Lowest Reading of a Min. Therm. on the 4th	15·0	20·7
Range of Thermometer Readings .....	37·1	30·8
Mean of all the Highest Readings .....	41·1	42·2
Mean of all the Lowest Readings .....	31·0	32·5
Mean Daily Range .....	10·1	9·7
Deduced Monthly Mean (from Mean of Max. and Min.) .....	35·9	37·1
Mean Temperature from Dry Bulb .....	36·1	37·1
Adopted Mean Temperature.....	36·0	37·1
Mean Temperature of Evaporation .....	34·7	36 0
Mean Temperature of Dew Point .....	32·8	33·8
Mean elastic force of Vapour .....	0·188in	0·196in
Mean weight of Vapour in a cub. ft. of air.....	2·1gr	2·4gr
Mean additional weight required for saturation	0·4gr	0·4gr
Mean degree of Humidity (saturation 1·00)..<	0 88	0·86
Mean weight of a cubic foot of air .....	554·2gr	549·6gr
Fall of Rain .....	1·793in	4·131in
Number of days on which Rain fell.....	18	19·6

The total number of miles registered during the month was 7446.

**Mean amount of Cloud (an overcast sky being indicated by 10·0) 8 3**

In the month of January, the highest reading of the Bar-

ometer during 46 years was on the 18th, in 1882, and was 20.450

The lowest                 ,,                 ,,                 26th, 1884..... 27·803

The highest Temperature „ 7th, 1887..... 59.9

The lowest	„	„	15th, 1881.....	4·6
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The highest adopted mean temperature of the month, 1875 42.5

**The lowest**                      „                      „                      1881..... 29·2

The first week was very cold. The daily highest readings of the thermometer being below the mean temperature of the month until the 8th. The lowest readings on these days were approximately 18°, 18°, 16°, 15°, 22°, and 29° respectively.

## FEBRUARY, 1893.

Results of Observations taken during the month.		Mean for the last 46 years.
Mean Reading of the Barometer .....	29·197	29·503
Highest „ on the 5th .....	29·942	30·063
Lowest „ on the 26th.....	28·236	28·688
Range of Barometer Readings.....	1·706	1·375
Highest Reading of a Max. Therm. on the 19th	57·0	52·1
Lowest Reading of a Min. Therm. on the 27th	20·3	22·4
Range of Thermometer Readings.....	36·7	29·7
Mean of all the Highest Readings .....	44·9	44·3
Mean of all the Lowest Readings. ....	33·4	33·6
Mean Daily Range .....	11·5	10·7
Deduced Monthly Mean (from Mean of Max. and Min.) .....	38·8	38·4
Mean Temperature from Dry Bulb.....	39·4	38·4
Adopted Mean Temperature .....	39·1	38·4
Mean Temperature of Evaporation .....	37·7	36·9
Mean Temperature of Dew Point.....	35·9	34·7
Mean elastic force of Vapour.....	0·211 in	0·193 in
Mean weight of Vapour in a cubic ft. of air....	2·4 gr	2·4 gr
Mean additional weight required for saturation	0·4 gr	0·4 gr
Mean degree of Humidity (saturation 1·00) ..	0·89	0·87
Mean weight of a cubic foot of air .....	542·0 gr	548·4 gr
Fall of Rain .....	5·762 in	3·486 in
Number of days on which Rain fell.....	22	17·0

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	1	3	2	5	4	10	1
Mean Velocity in miles per hour	7·5	11·0	9·3	8·0	8·7	16·3	16·5	2·2
Total No. of miles for each Direction	360	267	672	385	1038	1560	3963	53

The total number of miles registered during the month was 8298.  
The max. Velocity of the wind was 46 miles per hour. Direction W. by N., noon, on the 10th.

## FEBRUARY, 1893.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·7

In the month of February, the highest reading of the Barometer  
during 46 years, was on the 11th, in 1849, and was ... 30·452

The lowest                   ,,                   ,,                   6th, 1867.... 28·208

The highest Temperature                   ,,                   8th, 1877.... 58·3

The lowest                   ,,                   ,,                   18th, 1892.... 8·1

The highest adopted mean temperature of the month, 1869.... 44·0

The lowest                   ,,                   ,,                   1855.... 28·6

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A very wet and warm month with a remarkably low barometer.  
On 10 days the pressure was below 29 inches.

# MARCH, 1893.

Results of Observations taken during the Month.		Mean for the last 46 years.
Mean Reading of the Barometer .....	29·657	29·474
Highest                   ,,                   on the 25th .....	30·026	30·083
Lowest                   ,,                   on the 1st .....	28·906	28·692
Range of Barometer Readings .....	1·120	1·391
Highest Reading of a Max. Therm. on the 24th	65·0	57·1
Lowest Reading of a Min. Therm. on the 18th	21·0	22·3
Range of Thermometer Readings .....	44·0	34·8
Mean of all the Highest Readings .....	53·5	47·1
Mean of all the Lowest Readings .....	35·2	34·0
Mean Daily Range .....	18·3	13·1
Deduced Monthly Mean from Mean of Max and Min.....	43·4	39·6
Mean Temperature from Dry Bulb.....	43·0	39·9
Adopted Mean Temperature.....	43·2	39·7
Mean Temperature of Evaporation.....	40·9	37·8
Mean Temperature of Dew Point .....	38·2	35·3
Mean elastic force of Vapour .....	0·230 in	0·205 in
Mean weight of Vapour in a cub. ft. of air.....	2·6 gr	2·4 gr
Mean additional weight required for saturation	0·7 gr	0·5 gr
Mean degree of Humidity (saturation 1·00) ..	0·77	0·85
Mean weight of a cubic foot of air.....	545·7 gr	546·7 gr
Fall of Rain .....	1·699 in	3·077 in
Number of days on which Rain fell .....	14	17·4

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	5	1	0	1	7	13	2
Mean Velocity in miles per hour	4·5	7·2	12·5	0	4·7	12·0	14·3	5·3
Total No. of miles for each Direction	215	867	300	0	113	2021	4463	254

The total number of miles registered during the month was 8233.  
The max. Velocity of the wind was 37 miles per hour. Direction  
S.W. by W., on the 15th at noon.



## MARCH, 1893.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 6·0

In the month of March, the highest reading of the Barome-

ter during 46 years, was on the 6th, in 1852, and was.. 30·401

The lowest                   ,,                   ,,                   31st, 1860.... 28·199

The highest Temperature                   ,,                   25th, 1871.... 68·0

The lowest                   ,,                   ,,                   6th, 1886.... 11·5

The highest adopted mean temperature of the month, 1871.... 44·0

The lowest                   ,,                   ,,                   1855 and 1892 35·6

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The rainy weather of last month held on through the first week of March, with a high barometer. The dry weather set in on the 18th with a rapid rise of the barometer from its principal depression in the month. The general curve of the pressure during the month is represented by two long wave-crests, divided by a short hollow in the middle of the month.

## APRIL, 1893.

Results of Observations taken during the Month.		Mean for the last 46 Years.
Mean Reading of the Barometer .....	29·762	29·486
Highest                   ,,                   on the 8th ....	30·146	29·969
Lowest                   ,,                   on the 29th ....	29·388	28·803
Range of Barometer Readings.....	0·758	1·166
Highest Reading of a Max. Therm. on the 24th	74·0	66·2
Lowest Reading of a Min. Therm. on the 11th	25·7	28·1
Range of Thermometer Readings .....	48·3	38·1
Mean of all the Highest Readings.....	61·6	55·9
Mean of all the Lowest Readings .....	37·8	37·7
Mean Daily Range .....	23·8	18·2
Deduced Monthly Mean (from Mean of Max. and Min.) .....	48·2	44·4
Mean Temperature from Dry Bulb .....	48·2	44·5
Adopted Mean Temperature .....	48·2	44·5
Mean Temperature of Evaporation .....	44·1	41·6
Mean Temperature of Dew Point .....	39·3	38·1
Mean elastic force of Vapour .....	0·245 in	0·235 in
Mean weight of Vapour in a cub. ft. of air ...	2·8gr	2·7gr
Mean additional weight required for saturation	1·0gr	0·7gr
Mean degree of Humidity (saturation 1·00)..	0·73	0·80
Mean weight of a cubic foot of air .....	543·1gr	542·1gr
Fall of rain .....	0·811 in	2·265 in
Number of Days on which rain fell .....	8	14·6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	5	3	6	0	3	1	11	1
Mean Velocity in miles per hour	6·6	7·6	8·9	0	6·1	9·6	9·5	7·1
Total No. of miles for each Direction.	788	547	1288	0	441	230	2493	171

The total number of miles registered during the month was 5958.  
The max. Velocity of the wind was 30 miles per hour. Direction  
W. by S., on the 30th, at noon.

APRIL, 1893.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	4·8
In the month of April, the highest reading of the Barometer during 46 years, was on the 17th, in 1887, and was ....	30·251
The lowest „ „ 20th, 1868....	28·358
The highest Temperature „ 14th, 1852....	74·1
The lowest „ „ 18th, 1892....	20·8
The highest adopted mean temperature of the month, 1865....	48·5
The lowest „ „ 1879....	40·7

**A fine dry month with a generally high and steady barometer. There were three shallow depressions at the beginning, middle, and end of the month accompanied by a little rain.**

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## JUNE, 1893.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 6·6

In the month of June, the highest reading of the Barometer

during 46 years, was on the 15th, in 1874, and was.... 30·219

The lowest                   ,,                   ,,                   23rd, 1893.... 28·813

The highest Temperature                   ,,                   18th, 1893.... 88·7

The lowest                   ,,                   ,,                   17th, 1892.... 84·1

The highest adopted mean temperature of the month, 1858.... 59·0

The lowest                   ,,                   ,,                   1856 and 1860 52·2

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A very warm month, marked by the highest shade temperature of 46 years. This was 88·7° on the 18th, and is half a degree higher than the previous maximum, which was read on the 15th of July, 1868; and on 16 days the maximum shade-thermometers stood above 70°. But the mean temperature of the month is as much as 1° lower than that of June, 1858. The barometer was generally high in the first half of the month, with two short and shallow depressions. A deep fall began on the 19th and reached the lowest point of the hollow on the 23rd, when the pressure fell below 29 inches for the first time since March 1st.

JULY, 1893.

Results of Observations taken during the Month		Mean for the last 46 years.
Mean Reading of the Barometer .....	29·465	29·508
Highest                   ,,                   on the 27th .....	29·847	29·877
Lowest                   ,,                   on the 19th .....	29·031	28·993
Range of Barometer Readings .....	0·816	0·884
Highest Reading of a Max. Therm. on the 7th	83·5	78·8
Lowest Reading of a Min. Therm. on the 31st	45·7	42·1
Range of Thermometer Readings.....	37·8	36·7
Mean of all the Highest Readings .....	70·3	67·8
Mean of all the Lowest Readings .....	52·3	50·7
Mean Daily Range .....	18·0	17·1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	59·4	57·7
Mean Temperature from dry bulb .....	58·9	57·8
Adopted Mean Temperature.....	59·2	57·8
Mean Temperature of Evaporation .....	55·7	54·7
Mean Temperature of Dew Point .....	52·5	52·1
Mean elastic force of Vapour .....	0·397 in	0·389 in
Mean weight of Vapour in a cub. ft. of air.....	4·5 gr	4·5 gr
Mean additional weight required for saturation	1·2 gr	1·0 gr
Mean degree of Humidity (saturation 1·00) ...	0·79	0·82
Mean weight of a cubic foot of air .....	523·5 gr	527·3 gr
Fall of Rain .....	5·026 in	4·222 in
Number of days on which Rain fell .....	20	18·1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	5	3	4	1	1	14	1
Mean Velocity in miles per hour	5·0	7·2	8·4	9·5	7·6	14·7	10·2	10·4
Total No. of miles for each Direction	239	866	604	910	183	353	3414	251

The total number of miles registered during the month was 6820.  
The max. Velocity of the wind was 30 miles per hour. Direction W., on the 17th at 6 p.m.

JULY, 1893.				
Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·7				
In the month of July, the highest reading of the Barometer				
during 46 years, was on the 24th, in 1868, and was.... 30·112				
The lowest	„	„	15th, 1877....	28·564
The highest Temperature	„	„	22nd, 1873....	88·2
The lowest	„	„	1st, 1857....	36·0
The highest adopted mean temperature of the month, 1852.... 63·0				
The lowest	„	„	1888....	54·5
<div> <div></div> <div>A very warm month, with an average rainfall. The temperature was more even during this month than in the last, the highest readings being above 70° only on 10 days, against the 16 days of June.</div> </div>				

In the month of July, the highest reading of the Barometer

The lowest                  „                  .,                  15th, 1877.... 28·564

The highest Temperature „ 22nd, 1873.... 88.2

The lowest	„	„	1st, 1857....	36·0
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**The highest adopted mean temperature of the month, 1852. . . . 63·0**

The lowest	„	„	1888....	54·5
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A very warm month, with an average rainfall. The temperature was more even during this month than in the last, the highest readings being above 70° only on 10 days, against the 16 days of June.





## AUGUST, 1893.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 6·6

In the month of July, the highest reading of the Barometer

during 46 years, was on the 21st, in 1874, and was.... 30·114

The lowest                   ,,                   ,,                   31st, 1876.... 28·555

The highest Temperature                   ,,                   2nd, 1868.... 88·0

The lowest                   ,,                   ,,                   13th, 1887.... 33·4

The highest adopted mean temperature of the month, 1857 & '84 61·0

The lowest                   ,,                   ,,                   1848.... 52·5

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The excess of rainfall is mainly owing to two storms, with shallow barometric depressions, on the 2nd and 10th. These together gave over three inches of rain. Over an inch of rain fell between 5-30 p.m. and 6-30 p.m. on the 10th, divided between two thunderstorms. The first of these storms was perhaps the most magnificent ever witnessed at Stonyhurst. The telephone wires suffered, but no other damage was done.

Total No. of miles for each	284	166	0	0	765	1684	3724	206
Direction								

The total number of miles registered during the month was 6829.

The max. Velocity of the wind was 30 miles per hour. Direction

by W on the 28th at 3 p.m.

SEPTEMBER, 1893.

**Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·3**

In the month of September, the highest reading of the Bar.

ometer during 46 years, was on the 15th, in 1851, and was 30.274

**The lowest               ,,               ,,               2nd, 1883.... 28·323**

The highest Temperature	„	6th, 1868....	85·0
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The lowest	„	„	25th, 1885, and	
			30th, 1888..	29·8

The highest adopted mean temperature of the month, 1865 59.1

The lowest	„	„	1863	50·9
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Three heavy rainfalls, averaging over an inch for each, occurred on the 18th, 26th, and 28th. and three deep barometric depressions passed over, with their lowest readings on the 8th, 20th, and 29th.

## OCTOBER, 1893.

Results of Observations taken during the Month.		Mean for the last 46 years.
Mean Reading of the Barometer .....	29·406	29·422
Highest „ on the 23rd.....	30·012	30·013
Lowest „ on the 4th .....	28·572	28·645
Range of Barometer Readings .....	1·440	1·368
Highest Reading of a Max. Therm. on the 17th	65·9	64·2
Lowest Reading of a Min. Therm. on the 31st	25·1	29·1
Range of Thermometer Readings.....	40·8	35·1
Mean of all the Highest Readings .....	57·8	54·6
Mean of all the Lowest Readings .....	42·0	41·7
Mean Daily Range .....	15·8	12·9
Deduced Monthly Mean (from Mean of Max. and Min.) .....	48·9	47·2
Mean Temperature from Dry Bulb.....	48·0	47·7
Adopted Mean Temperature .....	48·5	47·5
Mean Temperature of Evaporation.....	46·3	45·2
Mean Temperature of Dew Point.....	43·9	42·8
Mean elastic force of Vapour.....	0·287 in	0·276 in
Mean weight of Vapour in a cub. ft. of air....	3·3gr	3·2 gr
Mean additional weight required for saturation	0·8gr	0·6 gr
Mean degree of Humidity (saturation 1·00) ..	0·84	0·84
Mean weight of a cubic foot of air .....	536·1gr	537·4 gr
Fall of Rain .....	7·858in	5·085 in
Number of days on which Rain fell .....	23	21·8

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	3	0	1	1	10	15	1
Mean Velocity in miles per hour	0	4·0	0	6·4	4·0	9·5	11·5	6·1
Total No. of miles for each Direction.	0	286	0	154	97	2288	4125	146

The total number of miles registered during the month was 7096.  
The max. Velocity of the wind was 35 miles per hour. Direction W.N.W., on the 26th, at 9 a.m.

## OCTOBER, 1893.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7 5

In the month of October, the highest reading of the Barometer

during 46 years, was on the 5th, in 1884, and was ....30·06

The lowest                   ,,                   ,,                   19th, 1862.....28·139

The highest Temperature                   ,,                   9th, 1869.... 72·8

The lowest                   ,,                   ,,                   24th, 1892.... 22·8

The highest adopted mean temperature of the month, 1861 & '76 51·6

The lowest                   ,,                   ,,                   1880.... 43·1

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The barometer remained generally very low till the 17th, when it recovered for a week, and fell down again on the 25th to a moderate depression until the 30th. Both depressions were accompanied with rain, and heavy falls were registered on the 3rd and 14th, 1·416 and 1·182 inches.

893.		
	Month.	Mean for the last 46 years.
Reading of the Barometer .....	29.568	29.317
"          on the 21st ....	30.112	30.051
"          on the 17th ....	28.442	28.564
Barometer Readings .....	1.670	1.487
Reading of a Max. Therm. on the 16th	55.8	55.6
Reading of a Min. Therm. on the 22nd	27.2	25.8
Thermometer Readings.....	28.1	30.8
the Highest Readings .....	48.0	47.0
the Lowest Readings.....	35.5	36.2
Range .....	12.5	10.8
Monthly Mean (from Mean of Max. 1.) .....	41.1	41.4
Temperature from Dry Bulb .....	40.7	41.5
Wet Bulb Temperature .....	41.1	41.4
Temperature of Evaporation .....	39.4	39.1
Temperature of Dew Point.....	37.8	37.8
Force of Vapour.....	0.222 in	0.228 in
Weight of Vapour in a cub. ft. of air....	2.6 gr	2.6 gr
Additional weight required for saturation	0.4 gr	0.4 gr
Relative Humidity (saturation 1.00) ..	0.86	0.87
Weight of a cubic foot of air .....	547.6 gr	545.0 gr
" .....	4.575 in	4.297 in
Number of days on which Rain fell.....	20	19.6

## NOVEMBER, 1893.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·4

In the month of November, the highest reading of the Barometer

during 46 years, was on the 12th in 1857, and was.....30·350

The lowest                   ,,                   ,,                   11th, 1891.... 27·938

The highest Temperature                   ,,                   6th, 1872.... 61·9

The lowest                   ,,                   ,,                   17th, 1861.... 19·1

The highest adopted mean temperature of the month, 1881.. 47·0

The lowest                   ,,                   ,,                   1851.... 36·7

The recovery of excess in barometric pressure in this month is mainly due to the steady anticyclone which held together from the 6th to the 13th, when the mercury stood uniformly at over 30 inches, from the middle of the 6th to the middle of the 12th day. But on four of these days there was a little rain not exceeding ·01 inch.

The destructive gale in the middle of the month, which will be remembered as the most severe one that has visited the Country in the years of careful records, was hardly felt as a gale at Stonyhurst, the velocity of the wind never exceeding 37 miles an hour for any time long enough to leave a trustworthy register on the cylinder. Its force was greatest on the 18th at 11·0 p.m., 24 hours after the barometer had fallen to its lowest reading 28·519 through a nearly continuous slope from its maximum height 30·054 on the night of the 11th. And the forewarning of its approach was a run-round the compass, through a wheel and threequarters between 10·0 a.m., and 4·0 p.m. Little rain attended the gale, and it was followed by a short high wave of atmospheric pressure, with its crest over 30 inches on the 21st, and the following trough below 29 inches on the 25th, and this steep fall brought with it nearly an inch-and-a-half of rain,

**DECEMBER.**

Results of Observations taken during the Month.	Mean for the last 46 years.
Mean Reading of the Barometer .....29·455	29·460
Highest               ,,               on the 29th..30·302	30·073
Lowest               ,,               on the 20th..28·329	28·598
Range of Barometer Readings..... 1·973	1·475
Highest Reading of a Max. Therm. on the 16th 55·6	53·0
Lowest Reading of a Min. Therm. on the 1st 17·6	20·0
Range of Thermometer Readings ..... 38·0	33·0
Mean of all the Highest Readings ..... 46·1	42·9
Mean of all the Lowest Readings..... 34·7	32·8
Mean Daily Range ..... 11·4	10·1
Deduced Monthly Mean (from Mean of Max. and Min.) ..... 40·4	37·9
Mean Temperature from Dry Bulb ..... 40·9	38·6
Adopted Mean Temperature ..... 40·7	38·3
Mean Temperature of Evaporation ..... 38·9	36·7
Mean Temperature of Dew Point..... 36·7	34·8
Mean elastic force of Vapour ..... 0·217 in	0·204 in
Mean weight of Vapour in a cub. ft. of air .. 2·5gr	2·4gr
Mean additional weight required for saturation 0·5gr	0·4gr
Mean degree of Humidity (saturation 1·00) .. 0·86	0·87
Mean weight of a cubic foot of air ..... 545·7gr	548·5gr
Fall of rain..... 4·903 in	5·268 in
Number of Days on which Rain fell ..... 25	18·9

No of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	0	1	0	6	13	10	0
Mean Velocity in miles per hour	2·3	0	8·3	0	7·0	7·0	9·3	0
Total No. of miles for each Direction	65	0	199	0	1005	2173	2166	0

The total number of miles registered during the month was 5608. The max. Velocity of the wind was 36 miles per hour. Direction W., at 7 a.m., on the 8th.



## DECEMBER, 1893.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·8

In the month of December, the highest reading of the Bar-

ometer during 46 years, was on the 22nd in 1849, and was 30·378

The lowest                   ,,                   8th, 1886.... 27·350

The highest Temperature                   ,,                   9th, 1876.... 58·1

The lowest                   ,,                   24th, 1860 .... 6·7

The highest adopted mean temperature of the month, 1857.... 44·6

The lowest                   ,,                   1878.... 80·3

A mild month with a wide range of barometric pressure. On 9 days the mercury fell below 29 inches, and on 5 days it stood above 30. There were no heavy rainfalls, but only six days with-rain.

on 2

## Summary of Observations FOR 1893.

		Mean for the last 46 years
Mean Reading of the Barometer .....	29·526	29·489
Highest ,, on December 29th .....	30·302	30·279
Lowest ,, on February 26th .....	28·236	28·265
Range of Barometer Readings .....	2·066	2·014
Highest Reading of a Max. Therm. on June 18th	88·7	81·6
Lowest Reading of a Min. Therm. on Jan. 4th	15 0	15·4
Range of Thermometer Readings .....	73·7	66·2
Mean of all the Highest Readings .....	57·8	54·7
Mean of all the Lowest Readings .....	41·2	40·6
Mean Daily Range .....	16·6	14·1
Deduced yearly Mean (from Mean of Max. and Min ) .....	48·5	46·8
Mean Temperature of dry bulb .....	48·4	46·7
Adopted Mean Temperature .....	48·4	46·8
Mean Temperature of Evaporation .....	45 8	44·5
Mean Temperature of Dew Point .....	43·0	42·1
Mean elastic force of Vapour .....	0·286 in	0·273 in
Mean weight of Vapour in a cubic foot of air ....	3·2 gr	3·3 gr
Mean additional weight required for saturation	0·9 gr	0·7 gr
Mean degree of Humidity (saturation 1·00) ..	0·81	0·84
Mean weight of a cubic foot of air .....	538·0 gr	539·4 gr
Total fall of rain in the Year .....	50·553 in	47·262 in
Number of Days per Month on which Rain fell	17·7	18·0

The Maximum monthly mean height of the Barometer was

in February, 1891, and was

29·997

The Minimum ,, ,, in December, 1868, and was

28·984

The Maximum yearly mean height of the Barometer was in

1887, and was

29·582

The Minimum ,, ,, in 1866, and was

29·389

## SUMMARY, 1893.

The greatest monthly range of the Barometer was in		
January, 1884, and was .....	2·409	
The least ,, ,, in July, 1852, and was .....	0·505	
The highest reading of the Barometer, during 46 years, was		
on January 18th, 1882, and was .....	30·480	
The lowest ,, ,, on December 8th, 1886, and was	27·350	
Extreme range .....	3·130	
The highest temperature was on June 18th, 1893, and was..		88·7
The lowest ,, ,, January 15th, 1881 ..	4·6	
The highest adopted mean temperature of a month, July, 1868		62·4
The lowest ,, ,, February, 1855..	28·6	
The highest adopted mean temperature of a year, 1868..		49·1
The lowest ,, ,, ,, ,, 1879..	44·1	
The greatest monthly mean weight of vapour, } in a cubic foot of air .....		
July, 1852..		5·1 gr
The least ,, ,, ,, February, 1855..		1·4 gr
The greatest fall of rain in a month, was in October, 1870, and		
was.....		13·437 in
The least ,, ,, ,, March, 1852..		0·047 in
The greatest number of days on which } rain fell in one month .....		
July, 1861, Dec. 1868		31
The least ,, ,, ,, March, 1852..		8

No. of days in the year on which the prevailing wind was .....	N	NE	E	SE	S	SW	W	NW
	23	35	41	12	24	66	146	18
Mean Velocity in miles per hour.....	5·1	5·8	8·4	5·8	6·2	11·0	11·2	5·2
Total No. of miles for each Direction .....	3669	5447	9990	2537	4530	16085	38244	2966

The total No. of miles registered during the year was 83468.

The max. Velocity of the wind was 46 miles per hour ; direction W. by N., at Noon, on February 10th.

# DATES OF OCCASIONAL PHENOMENA.

1893.	Frost.	Hoar Frost.	Snow.	Hail.
January February March April May June July August September October November December	1-21, 26-28 5, 6, 11-13, 15, 17, 20-28 1, 2, 10-14, 16-26, 28-31 1-5, 7-15, 29 1 13 10, 12, 21 6, 7, 30, 31 1, 4-8, 10, 15, 16, 18-24, 26, 27 1-3, 9-15, 20, 26, 31	28 14	1, 3, 6, 14, 17 12, 22, 24, 25, 26, 16, 17	24, 26 16, 17 29 22, 23, 30 26 22 7, 9, 20, 21

# DATES OF OCCASIONAL PHENOMENA.

(Continued.)

1893.	Heavy Rain	Fog	Thunder.	Lightning.	Lunar Halo.	Solar Halo.
January	9, 13	16, 26, 27	16		27	
February	1	3			6, 28	
March		14			29	
April		27		19	26	26
May	17, 29	28	20	18, 19		10
June	26, 28		18, 19, 20, 22, 29	27		
July	10, 11, 18		3, 4, 7, 9, 27	8, 9, 10, 11, 12		
August	2, 4, 6, 10	14, 16, 30	3, 8, 9, 10, 11, 12	10, 22		
September	13, 22, 26, 28, 30	26	4, 10, 22	8, 30		
October	3, 4, 6, 13, 14, 15		8, 23, 29	1, 2, 3, 5		
November	25, 27	27	3			4
December	8, 12, 22	5, 11, 29, 30, 31	8, 9		17	

Aurora Borealis, August 12—13, 11 p.m. and 1 a.m.

Rainbows, August 23 and 25.

“ September 21, 22, 29, 30.

## SUMMARY OF SOLAR OBSERVATIONS.

Number of days of Observation in Each Month.

1893	Recorded Sunshine.	Amount of Sunshine expressed in hours.	Number of Sun Drawings, 10 $\frac{1}{4}$ inches to diameter.	Other Drawings and Notes.	Entire Chromosphere Measured.	Chromosphere partially measured.	Photographs of Spot spectra.
January ..	19	38.1	8				2
February	17	46.9	6				1
March ..	28	162.1	18				11
April ....	28	223.7	24				56
May .....	27	176.5	19				82
June .....	29	207.4	20				6
July .....	29	180.2	17				
August ..	81	194.8	18				8
September	26	144.8	9				40
October ..	25	110.5	17				19
November	14	55.4	1				
December	12	26.9	3				
Totals ..	280	1567.8	160				175



# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January - - -	3.8	4.3	3.4	2.6	0	0	0	0	0	0.2	0.3	0	1.1	0.6	4.6	0	1.6
February - - -	3.7	0	0	0	1.0	0.7	2.6	3.7	0	1.2	1.0	4.6	0	0.9	1.6	0	3.7
March - - -	0	0	0	4.3	0	0	0	2.6	0	8.5	7.4	9.9	6.8	0	1.2	3.8	3.8
April - - -	0	9.8	11.0	5.2	10.8	9.3	9.7	9.5	10.6	10.2	5.5	11.5	8.2	11.5	3.9	1.0	0
May - - -	0	0	7.2	11.0	8.6	8.5	11.6	11.7	14.2	13.6	8.4	2.2	10.2	5.0	2.3	0.3	0
June - - -	3.5	8.7	1.3	8.6	10.6	0	6.8	12.3	7.7	7.0	13.4	8.2	11.5	13.2	12.1	13.2	10.7
July - - -	5.2	9.8	4.5	8.3	11.2	10.3	9.7	5.2	2.4	2.8	4.0	3.6	0.4	2.5	3.8	5.8	13.3
August - - -	1.2	6.8	4.5	6.5	6.2	3.4	3.0	3.4	12.8	5.3	2.6	11.2	3.6	10.2	9.3	4.0	8.8
September - - -	0.8	9.8	4.8	9.5	8.5	0.4	2.5	4.0	6.8	10.0	9.5	9.4	0	2.4	0.7	9.2	5.9
October - - -	7.2	5.1	6.0	4.2	6.2	6.9	0	5.0	6.6	3.4	6.0	7.2	1.5	0	0	1.0	1.7
November - - -	0	0.7	0	4.2	3.5	6.0	5.4	2.2	3.2	0	0	0	5.8	0	4.4	0	0
December - - -	6.4	5.4	0	0	0	0	1.6	0.9	0	0	1.7	0	0	2.8	0	0	0.5



# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

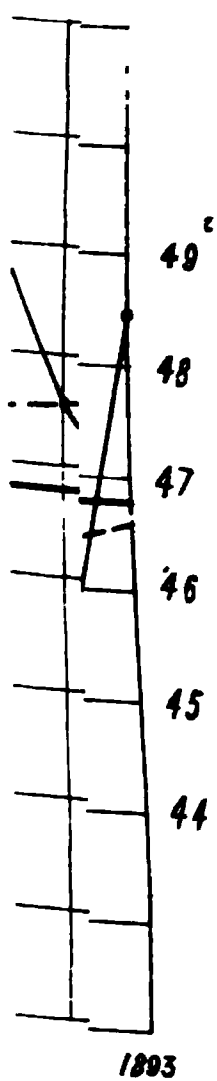
(Continued)

MONTH.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Per centage each month.
January -	0.7	0	3.1	0	0	0	0	0.3	0.8	0.8	0.8	0.5	3.2	5.4	38.1	14.7
February -	0	4.4	0.6	0	0	2.8	0.3	0	0	7.2	6.9	..	..	..	46.9	16.9
March -	10.7	7.8	9.2	9.4	8.5	8.4	7.8	9.2	4.7	6.0	10.6	6.8	10.4	4.8	162.1	44.2
April -	1.5	3.5	4.8	10.8	12.0	12.3	6.8	8.4	9.8	3.4	6.8	5.6	10.3	..	223.7	53.9
May -	4.2	2.7	3.6	7.1	7.7	3.6	5.3	3.7	0	6.3	4.6	0.3	4.8	7.8	176.5	36.6
June -	9.4	8.3	3.4	0.6	0.9	1.4	3.8	5.8	7.2	3.8	1.2	2.1	10.7	..	207.4	42.0
July -	2.5	0	10.2	10.6	12.3	0	6.8	4.2	5.2	6.7	1.3	2.2	8.2	7.2	180.2	36.5
August -	10.0	8.0	3.8	8.3	5.9	8.0	9.3	8.8	2.3	1.2	11.9	6.6	6.7	1.2	194.8	43.5
September -	0	3.9	3.3	7.0	4.5	6.4	8.4	4.2	0	1.1	0	7.5	4.3	..	144.8	38.4
October -	0.8	0.6	0	0.7	7.4	4.1	0	0.3	5.8	3.1	0	3.8	7.6	8.3	110.5	33.5
November -	0	3.2	2.2	0	4.4	5.4	0	0	4.8	0	0	0	0	..	55.4	21.0
December -	1.9	0	0	0	0.6	0.8	0	1.4	0	0	0	0	0	2.9	26.9	11.1



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## OBSERVATIONS OF UPPER CLOUDS (CIRRUS).

Date 1898.	G. M. T.	Clouds.		Wind.		Direction of Lower Clouds.
		Direction.	V'locity (0—6).	Direction.	Force. (0—12).	
January 5	7-8 a.m.	N.	1	N.N.E.	1	
„ 13	1-30 p.m.	N.W.	2	N.W. by W.	3	N.W.
„ 15	12-50 p.m.	N.W.	2	W.S.W.	1	N.W.
„ 16	4-0 p.m.	N.W.	1	N.E.	1	N.W.
„ 18	Noon.	N.	2	S.E. by S.	2	S.W.
„ 18	1-58 p.m.	N.W.	1	S.W.	5	S.W. by W.
„ 20	9-58 a.m.	N.	1	W. by S.	4	S.W.
„ 25	12-50 p.m.	N.	2	W.S.W.	2	S.W.
„ 27	9-12 a.m.	N.W.	1	S.W. by W.	0	
„ 27	2-30 p.m.	W.	2	S.W. by S.	1	
„ 28	9-10 a.m.	N.W.	1	S.E.	2	S.E.
„ 30	Noon.	N.W.	1	S. by W.	3	S.
„ 30	1-58 p.m.	S.E.	..	S.S.W.	2	S.W.
Feb. 5	10-0 a.m.	N.W.	1	E.N.E.	1	S.E.
„ 6	8-55 a.m.	N.	1	N.E. by E.	0	
„ 7	12-15 p.m.	N.W.	1	W.S.W.	5	S.W.
„ 8	11-10 a.m.	N.E.	2	W.	6	S.W.
„ 11	5-40 p.m.	N.	1	W. by S.	3	N.W.
„ 12	9-8 a.m.	N.	1	N.W. by W.	2	N.W.
„ 15	8-10 a.m.	N.	1	S.W. by S.	0	S.W.
„ 27	8-40 a.m.	S.E.	2	W.S.W.	3	
„ 27	3-0 p.m.	S.	2	W. by S.	2	W.
„ 28	5-30 p.m.	W.	2	S.W. by S.	1	
March 8	10-8 a.m.	N.E.	3	W.S.W.	2	W.
„ 10	2-0 p.m.	S.W.	2	W.	6	N.W.
„ 11	8-0 a.m.	N.W.	2	S.W. by W.	1	
„ 11	9-0 a.m.	N.W.	2	S.W. by W.	1	
„ 13	10-20 a.m.	N.E.	3	S.S.W.	1	S.W.
„ 13	Noon.	N.E.	2	W.S.W.	2	S.W.
„ 13	2-0 p.m.	N.E.	2	W. by S.	3	S.W.
„ 13	4-0 p.m.	N.E.	2	W.	3	S.W.
„ 15	8-7 a.m.	N.E.	2	S.W.	5	S.W.
„ 16	7-5 a.m.	N.E.	2	W. by N.	3	
„ 22	8-10 a.m.	N.	1	N.N.E.	1	
„ 23	2-40 p.m.	N.W.	1	S.W. by S.	1	
„ 29	9-0 a.m.	N.E.	1	N.E. by N.	1	
„ 30	10-9 a.m.	N.W.	1	S.W. by W.	0	

## OBSERVATIONS OF UPPER CLOUDS (Continued).

Date 1893.	G. M. T.	Clouds.		Wind.		Direction of Lower Clouds.
		Direction.	V'locity (0—6)	Direction.	Force (0—12)	
March 30	1-30 p.m.	N. W.	1	W.	2	
„ 31	9-0 a.m.	N.	2	Lost.	..	S. W.
„ 31	Noon.	N. by W.	1	S. W. by S.	3	S. W.
April 2	8-0 a.m.	N.	2	N. by W.	0	
„ 7	9-0 a.m.	W. by S.	1	N. N. E.	1	
„ 8	10-10 a.m.	S. E.	1	E.	2	
„ 10	6-0 p.m.	E.	1	N. N. E.	2	
„ 11	8-5 a.m.	S. E.	1	E. N. E.	4	
„ 12	10-17 a.m.	E. by N.	1	S. S. W.	1	N. W.
„ 15	10-5 a.m.	E.	2	W. S. W.	4	S. W.
„ 18	5-40 p.m.	N.	1	W. by S.	1	
„ 20	8-45 a.m.	E. S. E.	1	N. W. by W.	1	
„ 24	10-9 a.m.	N. by W.	1	S. S. W.	1	
„ 25	9-50 a.m.	E.	1	N. N. E.	1	
„ 28	10-45 a.m.	N. by E.	1	W. by N.	1	
May 3	3-0 p.m.	N. W.	2	W.	3	
„ 4	10-0 a.m.	N. E.	1	S. S. W.	1	
„ 10	8-7 a.m.	N. by W.	1	N. E. by N.	1	
„ 10	2-15 p.m.	N. by W.	1	E. N. E.	1	
„ 10	4-0 p.m.	N. by W.	1	E. by N.	1	
„ 11	8-0 a.m.	N. E.	2	N. E.	0	
„ 13	9-30 a.m.	N. E.	1	S. by E.	1	
„ 24	5-30 p.m.	N. W.	1	N. W. by W.	2	
„ 27	7-0 a.m.	N. W.	2	E.	0	
June 7	7-0 a.m.	N. N. W.	2	N. N. E.	1	
„ 12	5-15 p.m.	N. E.	1	E. by N.	2	
„ 14	9-0 a.m.	N. W.	2	N. E. by N.	2	
„ 15	7-0 a.m.	N. N. W.	1	N. N. E.	1	
„ 16	8-45 a.m.	N. W.	1	N. N. E.	0	
„ 16	3-15 p.m.	N. W.	1	W.	2	
„ 26	3-45 p.m.	N. N. E.	1	W. N. W.	0	S. W.
„ 27	8 40 a.m.	N. N. W.	1	S. W. by W.	3	S. W.
July 1	7-5 a.m.	N. W.	1	N. N. E.	1	
„ 1	8-0 a.m.	N. W.	2	N. E. by N.	1	
„ 2	9-10 a.m.	N. by E.	1	W.	1	S. W.

# SUMMARY OF SOLAR OBSERVATIONS.

Number of days of Observation in Each Month.

1893	Recorded Sunshine.	Amount of Sunshine expressed in hours.	Number of Sun Drawings, 10 $\frac{1}{4}$ inches to diameter.	Other Drawings and Notes.	Entire Chromosphere Measured.	Chromosphere partially measured.	Photographs of Spot spectra.
January ..	19	38.1	8				2
February	17	46.9	6				1
March ..	23	162.1	18				11
April ....	28	223.7	24				56
May .....	27	176.5	19				82
June .....	29	207.4	20				6
July .....	29	180.2	17				
August ..	31	194.8	18				8
September	26	144.8	9				40
October ..	25	110.5	17				19
November	14	55.4	1				
December	12	26.9	3				
Totals ..	280	1567.8	160				175

c denotes chromosome, s spot spectra.

1893.	January	February	March	April	May	June	July	August	Sept.	October	Nov.	Dec.
1	.48			.48		.46	.36	.50	.44	.49		.54
2	.48			.38	.42	.40	.35		.61	.42		.53
3		.49	.50	.40	.37,c		.38	.44	.39			
4				.37,c	.48,c	.64	.40		.40	.40		
5				.41,c	.40,c		.40	.39		.41	.42	
6		.38		.40,c	.41	.38,c			.67			
7				.43,c	.66	.42,c	.38	c		.48		
8				.40,c	.39,c	.46		.40	.39	.38		
9				.39	.37,c	.43		.44	.41	.37		
10			.35		.52	.42		.41	.42	.40		
11			.65	.39,c	.74		.65	.41	.43			
12			.44		.39	.42	.33	.41				
13	.39		.45	.74	.41		.33			.42		
14	.47	.46		.40,c		.40		.41				
15						.41		.42				
16			.33			.39,c						
17		.45				.42				.34 & .68		
18			.32	.70	.38	.40						
19			.40	.53	.51	.44,c		.67				
20	.41		.44	.46	.43	.46	.49					
21			.38	.37,c			.65	.42				
22			.39	.48,c	.58		.38	.37		.33		
23			.47	.36,c				.39		.42		
24			.38	c		.57	.42	.38				
25			.39	.40,c	.75			.42				
26			.45	.39,c		.38	.42	.72		.47		
27	.40	.35	.52	.48	.48		.38,c	.50				
28	.38	.38	.38	.46				.47				
29				.65		.69	.41			.45		
30			.41	.46		.32,c	.33			.38		
31	.45				.36,c		.46			.38		.46

# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January - - -	3.8	4.3	3.4	2.6	0	0	0	0	0	0.2	0.3	0	1.1	0.6	4.6	0	1.6
February - - -	3.7	0	0	0	1.0	0.7	2.6	3.7	0	1.2	1.0	4.6	0	0.9	1.6	0	3.7
March - - -	0	0	0	4.3	0	0	0	2.6	0	8.5	7.4	9.9	6.8	0	1.2	3.8	3.8
April - - -	0	9.8	11.0	5.2	10.8	9.3	9.7	9.5	10.6	10.2	5.5	11.5	8.2	11.5	3.9	1.0	0
May - - -	0	0	7.2	11.0	8.6	8.5	11.6	11.7	14.2	13.6	8.4	2.2	10.2	5.0	2.3	0.3	0
June - - -	3.5	8.7	1.3	8.6	10.6	0	6.8	12.3	7.7	7.0	13.4	8.2	11.5	13.2	12.1	13.2	10.7
July - - -	5.2	9.8	4.5	8.3	11.2	10.3	9.7	5.2	2.4	2.8	4.0	3.6	0.4	2.5	3.8	5.8	13.3
August - - -	1.2	6.8	4.5	6.5	6.2	3.4	3.0	3.4	12.8	5.3	2.6	11.2	3.6	10.2	9.3	4.0	8.8
September - - -	0.8	9.8	4.8	9.5	8.5	0.4	2.5	4.0	6.8	10.0	9.5	9.4	0	2.4	0.7	9.2	5.9
October - - -	7.2	5.1	6.0	4.2	6.2	6.9	0	5.0	6.6	3.4	6.0	7.2	1.5	0	0	1.0	1.7
November - - -	0	0.7	0	4.2	3.5	6.0	5.4	2.2	3.2	0	0	0	5.8	0	4.4	0	0
December - - -	6.4	5.4	0	0	0	0	1.6	0.9	0	0	1.7	0	0	2.8	0	0	0.5



# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

(Continued)

MONTH.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Per centage each month.
January -	0.7	0	3.1	0	0	0	0	0.3	0.8	0.8	0.8	0.5	3.2	5.4	38.1	14.7
February -	0	4.4	0.6	0	0	2.8	0.3	0	0	7.2	6.9	..	..	..	46.9	16.9
March -	10.7	7.8	9.2	9.4	8.5	8.4	7.8	9.2	4.7	6.0	10.6	6.8	10.4	4.8	162.1	44.2
April -	1.5	3.5	4.8	10.8	12.0	12.3	6.8	8.4	9.8	3.4	6.8	5.6	10.3	..	223.7	53.9
May -	4.2	2.7	3.6	7.1	7.7	3.6	5.3	3.7	0	6.3	4.6	0.3	4.8	7.8	176.5	36.6
June -	9.4	8.3	3.4	0.6	0.9	1.4	3.8	5.8	7.2	3.8	1.2	2.1	10.7	..	207.4	42.0
July -	2.5	0	10.2	10.6	12.3	0	6.8	4.2	5.2	6.7	1.3	2.2	8.2	7.2	180.2	36.5
August -	10.0	8.0	3.8	8.3	5.9	8.0	9.3	8.8	2.3	1.2	11.9	6.6	6.7	1.2	194.8	43.5
September -	0	3.9	3.3	7.0	4.5	6.4	8.4	4.2	0	1.1	0	7.5	4.3	..	144.8	38.4
October -	0.8	0.6	0	0.7	7.4	4.1	0	0.3	5.8	3.1	0	3.8	7.6	8.3	110.5	33.5
November -	0	3.2	2.2	0	4.4	5.4	0	0	4.8	0	0	0	0	..	55.4	21.0
December -	1.9	0	0	0	0.6	0.8	0	1.4	0	0	0	0	0	2.9	26.9	11.1



# OBSERVATIONS OF DECLINATION AND DIP.

(Continued.)

MONTH	G.M.T.	WEST DECLINATION		G.M.T.	DIP.
	CIVIL DAY	Observations	Monthly Mean.	CIVIL DAY.	
	D. H. M.	° ' "	° ' "	D. H. M.	° ' "
July	3 16 7	18 50 9	18 54 51	21 12 10	69 6 26
	17 16 13	18 58 9			
	31 16 52	18 56 14			
August	7 16 18	18 56 24	18 50 51	23 16 15	69 8 1
	16 16 15	18 51 54			
	28 16 20	18 44 14			
Sept.	12 16 10	18 48 44	18 27 7	27 16 0	68 34 20
	19 16 10	18 5 29			
Oct.	2 16 0	18 57 54	18 39 36	18 12 30	69 3 38
	9 16 12	17 53 44			
	16 16 7	18 46 19			
	24 16 3	18 53 54			
Nov.	31 16 8	18 46 9	18 41 37	25 10 13	69 1 31
	13 16 12	18 44 39			
	27	18 38 34			
Dec.	4 16 12	18 22 44	18 47 37	14 13 7	69 4 40
	11 16 7	18 35 29			
	18 16 7	18 48 29			
	27 16 12	19 23 44			
Yearly Mean.			18 46 32		69 2 33

Local a



# DATES OF MAGNETIC DISTURBANCES, 1893.

The disturbances are divided into three classes, *small*, *moderate*, and *greater*; these are indicated by the initial letters of the classes, and the letter *c* denotes *calm*. The days are reckoned astronomically, from noon to noon. The asterisk signifies that the record was partly or wholly lost, according as it stands, with or without an initial letter.

MONTH.	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
1	s											s	
2	s											c	
3	m											c	
4	s											s	
5	s											m	
6	m											s	
7	c											c	
8	s											s	
9	m											s	
10	m											c	
11	m											s	
12	m											c	
13	s											c	
14	s	s	m	s	s	s	m	s	s	s	s	c	
15	c	m	m	s	s	s	g	s	s	s	c	s	
16	c	m	m	s	s	s	s	c	s	s	s	c	
17	s	m	c	s	s	s	s	c	s	s	s	c	
18	m	s	c	s	m	m	s	g	s	s	c	s	
19	m	s	c	s	s	m	s	s	s	c	c	c	
20	s	s	c	s	s	m	s	s	s	c	c	c	
21	m	s	c	s	s	s	m	c	s	c	c	c	
22	m	s	c	s	c	c	m	s	s	c	s	c	
23	s	s	c	s	s	c	m	c	s	c	c	c	
24	s	s	m	s	s	c	s	c	s	s	s	m	
25	m	c	m	c	s	s	s	c	s	s	s	s	
26	s	s	g	g	s	s	s	s	m	s	s	s	
27	s	c	s	s	c	s	s	s	s	s	m	s	
28	s	c	m	s	c	m	s	c	c	s	m	s	
29	s		s	c	s	m	s	s	m	s	s	m	
30	c		c	c	m	s	g	s	m	s	s	c	
31	c		s		c		s	s		s		s	
Totals.	s m g c	14 11 1 5	11 8 0 9	14 6 1 10	21 0 1 8	19 4 0 8	16 8 0 6	25 4 2 0	18 1 3 9	21 7 0 2	25 1 0 5	19 3 1 7	18 8 0 15

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<b>Andamento della pioggia in Pesaro nel</b> ventennio 1871-90 Comm. Luigi Guidi - - - - -	<b>P. Calvor</b>

# CORRIGENDA.

	True corresponding values for 1893 (mean for the last 46 years) as in this volume.
Mean weight of a cubic foot of air (mean for the last 33 years) in summary 1880 was given 539.1 grs. should be 538.6 grs.	539.4 grs.
Mean weight of a cubic foot of air (mean for the last 34 years) in October, 1881, was given 543.6 grs. should be 536.6 grs.	537.4 grs.
Mean weight of a cubic foot of air (mean for the last 35 years) in June, 1882, was given 545.1 grs. should be 530.9 grs.	531.2 grs.
Mean elastic force of vapour (mean for October 1882 and 1888) was given 0.287 and 0.219 in. should be 0.284 and 0.249 in.	0.276 in.
Mean weight of vapour in a cubic foot of air (mean for the last 37 years) in Oct. 1884, was given 3.1 grs. should be 3.2 grs.	3.2 grs.
Mean weight of a cubic foot of air (mean for the last 41 years) in August, 1888, was given 525.0 grs. should be 527.4 grs.	527.3 grs.
Mean elastic force of vapour (mean for the last 43 years) in January, 1890, was given 0.222 ins. should be 0.197 ins.	0.196 in.
Mean weight of a cubic foot of air (mean for the last 43 years) in January, 1890, was given 544.1 grs. should be 549.3 grs.	549.6 grs.
Mean weight of a cubic foot of air (mean for the last 43 years) in December, 1890, was given 540.4 grs. should be 548.0 grs.	548.5 grs.
Number of days on which rain fell (mean for the last 43 years) in December, 1890, was given 8.9 dys. should be 18.8 dys.	18.9 days
Mean weight of a cubic foot of air (mean for Dec. 1892, and last 45 yrs.) was given 454.7 and 538.7 grs. should be 554.4 and 548.6 gr	548.5 grs.
Mean weight of a cubic foot of air (mean for the year 1892,        "        ) was given 533.8 and 539.3 grs. should be 541.8 and 539.6 gr	539.4 grs.



APPENDIX

RESULTS

OF

METEOROLOGICAL OBSERVATIONS

TAKEN AT

ST. IGNATIUS' COLLEGE, MALTA,

BY THE

REV. J. DOBSON, S.J.

1893.

# CORRIGENDA.

	True corresponding values for 1893 (mean for the last 46 years) as in this volume.
Mean weight of a cubic foot of air (mean for the last 33 years) in summary 1880 was given 539.1 grs. should be 538.6 grs.	539.4 grs.
Mean weight of a cubic foot of air (mean for the last 34 years) in October, 1881, was given 543.6 grs. should be 536.6 grs.	537.4 grs.
Mean weight of a cubic foot of air (mean for the last 35 years) in June, 1882, was given 545.1 grs. should be 530.9 grs.	531.2 grs.
Mean elastic force of vapour (mean for October 1882 and 1888) was given 0.287 and 0.219 in. should be 0.284 and 0.249 in.	0.276 in.
Mean weight of vapour in a cubic foot of air (mean for the last 37 years) in Oct. 1884, was given 3.1 grs. should be 3.2 grs.	3.2 grs.
Mean weight of a cubic foot of air (mean for the last 41 years) in August, 1888, was given 525.0 grs. should be 527.4 grs.	527.3 grs.
Mean elastic force of vapour (mean for the last 43 years) in January, 1890, was given 0.222 ins. should be 0.197 ins.	0.196 in.
Mean weight of a cubic foot of air (mean for the last 43 years) in January, 1890, was given 544.1 grs. should be 549.3 grs.	549.6 grs.
Mean weight of a cubic foot of air (mean for the last 43 years) in December, 1890, was given 540.4 grs. should be 548.0 grs.	548.5 grs.
Number of days on which rain fell (mean for the last 43 years) in December, 1890, was given 8.9 dys. should be 18.8 dys.	18.9 days
Mean weight of a cubic foot of air (mean for Dec. 1892, and last 45 yrs.) was given 554.7 and 539.7 grs. should be 554.4 and 548.6 gr	548.5 grs.
Mean weight of a cubic foot of air (mean for the year 1892, " " ) was given 533.8 and 539.3 grs. should be 541.8 and 539.6 gr	539.4 grs.

APPENDIX

RESULTS

OF

METEOROLOGICAL OBSERVATIONS

## MARCH.

Results of Observations taken during the Month.	Mean for the last 10 years.
Mean Reading of the Barometer .....inches 30·073	29·989
Highest „ on the 13th „ 30·385	30·363
Lowest „ on the 31st „ 29·771	29·496
Range of Barometer Readings ..... 0·614	0·867
Highest Reading of a Max. Therm. on the 18th 66·2	74·7
Lowest Reading of a Min. Therm. on the 22nd 44·2	42·9
Range of Thermometer Readings ..... 22 0	31·8
Greatest Range in 24 hours on the 22nd..... 19·8	23·1
Mean of all the Highest Readings ..... 61·9	63·3
Mean of all the Lowest Readings ..... 49·4	50·8
Mean Daily Range ..... 12·5	12·5
Mean Temperature (deduced from Max. & Min) 55·0	56·2
Mean Temperature (deduced from Dry Bulb) 53·8	55·6
Adopted Mean Temperature..... 54·4	55·9
Mean Temperature of Evaporation..... 50·5	51·9
Mean Temperature of Dew Point ..... 47·5	48·7
Mean elastic force of Vapour .....inches 0·329	0·345
Mean weight of Vapour in a cub. ft. of air grains 3·7	3·9
Mean additional weight required for saturation „ 0·9	1·1
Mean degree of Humidity ..... 79	79
Mean weight of a cubic foot of air ....grains 540·4	537·0
Fall of Rain .....inches 2·268	0·896
Number of days on which Rain fell ..... 7	7
Mean amount of Cloud (an overcast sky=10) 4·5	4·4
Total number of miles of Wind indicated.... 7271	8175
Mean Velocity of Wind per hour.....miles 9·8	10·9

## APRIL.

Results of Observations taken during the Month.		Mean for the last 10 Years.
Mean Reading of the Barometer ..inches	30·048	29·925
Highest                   ,,           on the 16th ....	30·386	30·256
Lowest                   ,,           on the 28th ....	29·705	29·499
Range of Barometer Readings.....	0·681	0·757
Highest Reading of a Max. Therm. on the 28th	77·7	77·1
Lowest Reading of a Min. Therm. on the 17th	47·2	48·0
Range of Thermometer Readings .....	30·5	29·1
Greatest Range in 24 hours on the 21st.....	22·1	22·1
Mean of all the Highest Readings.....	66·9	67·4
Mean of all the Lowest Readings .....	53·1	54·3
Mean Daily Range .....	13·8	13·1
Mean Temperature (deduced from Max & Min)	59·0	59·9
Mean Temperature (deduced from Dry Bulb)	58·6	59·6
Adopted Mean Temperature .....	58·8	59·8
Mean Temperature of Evaporation .....	55·5	55·6
Mean Temperature of Dew Point .....	52·7	52·1
Mean elastic force of Vapour....inches	0·399	0·389
Mean weight of Vapour in a cub. ft. of air grains	4·4	4·4
Mean additional weight required for saturation,,	1·1	1·4
Mean degree of Humidity .....	81	77
Mean weight of a cubic foot of air ..grains	534·4	531·0
Fall of rain .....	0·247	0·768
Number of Days on which rain fell .....	3	6
Mean amount of Cloud (an overcast sky=10)..	4·3	4·3
Total number of miles of Wind indicated .....	6585	8473
Mean Velocity of Wind per hour.....miles	9·1	11·8

## MAY.

Result of Observations taken during the Month	Mean for the last 10 years
Mean Reading of the Barometer .....inches 29·999	29·991
Highest .                   ,,                   on the 3rd   ,,   30·143	30·180
Lowest                   ,,                   on the 22nd   ,,   29·632	29·614
Range of Barometer Readings..... 0·511	0·566
Highest Reading of a Max. Therm. on the 30th 81·9	82·6
Lowest Reading of a Min. Therm. on the 8th 52·5	53·9
Range of Thermometer Readings ..... 29·4	28·7
Greatest Range in 24 hours on the 17th ..... 22·1	24·1
Mean of all the Highest Readings ..... 74·4	72·6
Mean of all the Lowest Readings..... 59·6	58·4
Mean Daily Range ..... 14·8	14·2
Mean Temperature (deduced from Max.& Min.) 66·0	64·3
Mean Temperature (deduced from Dry Bulb) 64·8	63·8
Adopted Mean Temperature ..... 65·4	64·1
Mean Temperature of Evaporation ..... 61·3	60·0
Mean Temperature of Dew Point ..... 57·8	56·4
Mean elastic force of Vapour..... inches 0·479	0·456
Mean weight of Vapour in a cub. ft. of air grains 5·3	5·0
Mean additional weight required for saturation ,, 1·6	1·7
Mean degree of Humidity ..... 77	75
Mean weight of a cubic foot of air ..grains 525·7	527·1
Fall of Rain ..... ..inches 0·147	0·761
Number of days on which Rain fell ..... 2	4
Mean amount of Cloud (an overcast sky=10) 4·3	3·5
Total number of miles of Wind indicated .... 6460	7372
Mean Velocity of Wind per hour.....miles 8·7	9·9

## JUNE.

Results of Observations taken during the Month	Mean for the last 10 years
Mean Reading of the Barometer....inches 29·997	30·009
Highest                   ,,           on the 18th   ,, 30·164	30·176
Lowest                   ,,           on the 2nd   ,, 29·649	29·832
Range of Barometer Readings .....   ,, 0·515	0·343
Highest Reading of a Max. Therm. on the 30th 87·2	91·0
Lowest Reading of a Min. Therm. on the 10th 59·5	59·2
Range of Thermometer Readings ..... 27·7	31·8
Greatest Range in 24 hours on the 14th..... 22·2	25·7
Mean of all the Highest Readings ..... 80·6	80·6
Mean of all the Lowest Readings ..... 65·0	64·8
Mean Daily Range ..... 15·6	15·8
Mean Temperature (deduced from Max. & Min) 72·1	71·9
Mean Temperature (deduced from dry bulb) 71·3	71·2
Adopted Mean Temperature..... 71·7	71·6
Mean Temperature of Evaporation..... 66·4	65·9
Mean Temperature of Dew Point..... 62·4	61·7
Mean elastic force of Vapour .....inches 0·564	0·550
Mean weight of Vapour in a cub. ft. of air grains 6·1	6·0
Mean additional weight required for saturation 2·4	2·4
Mean degree of Humidity ..... 73	71
Mean weight of a cubic foot of air....grains 519·2	519·6
Fall of Rain .....inches 0·150	0·081
Number of Days on which rain fell ..... 2	1
Mean amount of Cloud (an overcast sky=10 2·6	2·0
Total number of miles of Wind indicated.... 6358	6213
Mean Velocity of Wind per hour.....miles 8·8	8·7

## JULY.

Results of Observations taken during the Month	Mean for the last 10 years.
Mean Reading of the Barometer.....inches 29·963	30·012
Highest „ on the 10th „ 30·083	30·155
Lowest „ on the 14th „ 29·785	29·844
Range of Barometer Readings ..... 0·298	0·311
Highest Reading of a Max. Therm. on the 14th 96·1	97·2
Lowest Reading of a Min. Therm. on the 20th 65·7	64·6
Range of Thermometer Readings..... 80·4	82·6
Greatest Range in 24 hours on the 5th..... 23·2	26·8
Mean of all the Highest Readings ..... 87·0	86·8
Mean of all the Lowest Readings ..... 70·8	69·8
Mean Daily Range ..... 16·2	17·0
Mean Temperature (deduced from Max. & Min.) 78·4	77·8
Mean Temperature deduced (from dry bulb)... 76·8	76·8
Adopted Mean Temperature..... 77·6	77·3
Mean Temperature of Evaporation ..... .. 71·0	70·2
Mean Temperature of Dew Point ..... 66·8	65·3
Mean elastic force of Vapour .....inches 0·657	0·625
Mean weight of Vapour in a cub. ft. of air grains 7·1	6·7
Mean additional weight required for saturation „ 3·0	3·4
Mean degree of Humidity ..... 70	67
Mean weight of a cubic foot of air .....grains 512·6	513·8
Fall of Rain ..... ..	...
Number of days on which Rain fell ..... ..	...
Mean amount of Cloud (an overcast sky=10) 1·7	0·6
Total number of miles of Wind indicated .... 6077	5600
Mean Velocity of Wind per hour.....miles 8·2	7·6



## AUGUST.

Results of Observations taken during the Month.	Mean for the last 10 years.
Mean Reading of the Barometer .....inches 30·023	30·010
Highest                   ,,           on the 17th           ,,   30·136	30·156
Lowest                   ,,           on the 31st           ,,   29·775	29·863
Range of Barometer Readings .....           ,,   0·361	0·298
Highest Reading of a Max. Therm. on the 28th 95·1	97·0
Lowest Reading of a Min. Therm. on the 11th 66·2	66·2
Range of Thermometer Readings..... 28·9	30·8
Greatest Range in 24 hours on the 28th ..... 23·6	26·2
Mean of all the Highest Readings..... 86·9	87·3
Mean of all the Lowest Readings..... 70·1	71·1
Mean Daily Range ..... 16·8	16·2
Mean Temperature (deduced from Max. & Min.) 77·7	78·4
Mean Temperature (deduced from Dry Bulb) 77·7	78·4
Adopted Mean Temperature ..... 77·7	78·4
Mean Temperature of Evaporation ..... 71·8	71·4
Mean Temperature of Dew Point..... 67·5	66·7
Mean elastic force of Vapour .....inches 0·673	0·653
Mean weight of Vapour in a cub. ft. of air grains 7·2	7·0
Mean additional weight required for saturation ,, 3·0	3·5
Mean degree of Humidity ..... 71	67
Mean weight of a cubic foot of air.....grains 512·5	512·2
Fall of Rain .....inches 0·030	..
Number of days on which Rain fell..... 1	..
Mean amount of Cloud (an overcast sky=10 1·4	1·0
Total number of miles of Wind indicated .... 4474	5442
Mean Velocity of Wind per hour.....miles 6·0	7·3

## SEPTEMBER.

Results of Observations taken during the Month.		Mean for the last 10 years.
Mean Reading of the Barometer .... inches	30·044	30 064
Highest                   ,,                   on the 14th   ,,	30·243	30·246
Lowest                   ,,                   on the 19   ,,	29·869	29·849
Range of Barometer Readings .....	0·374	0·397
Highest Reading of a Max. Therm. on the 25th	98·8	92·2
Lowest Reading of a Min. Therm. on the 6th..	66·5	62·9
Range of Thermometer Readings .....	32 3	29·3
Greatest Range in 24 hours on the 25th .....	22·2	23·0
Mean of all the Highest Readings .....	87·8	82 6
Mean of all the Lowest Readings .....	72·3	68·5
Mean Daily Range .....	15·5	14·1
Mean Temperature (deduced from Max & Min)	79·1	74 7
Mean Temperature (deduced from Dry Bulb)	77·6	74·5
Adopted Mean Temperature.....	78·4	77·3
Mean Temperature of Evaporation .....	71·7	68·9
Mean Temperature of Dew Point .....	67·5	64·8
Mean elastic force of Vapour..... inches	0·673	0·615
Mean weight of Vapour in a cub. ft. of air grains	7·1	6·7
Mean additional weight required for saturation,,	3·3	2·6
Mean degree of Humidity.....	68	72
Mean weight of a cubic foot of air .. grains	510·2	517·3
Fall of Rain .....	inches ..	1·373
Number of days on which Rain fell .....	..	5
Mean amount of Cloud (an overcast sky=10)	2·0	2·4
Total number of miles of Wind indicated ....	5817	5630
Mean Velocity of Wind per hour.....miles	·1 8	7·8

## OCTOBER.

Results of Observations taken during the Month.	Mean for the last 10 years.
Mean Reading of the Barometer. ....inches 30·048	30·045
Highest           ,,                   on the 25th   ,, 30·227	30·274
Lowest           ,,                   on the 29th   ,, 29·909	29·727
Range of Barometer Readings ..... 0·318	0·547
Highest Reading of a Max. Therm. on the 2nd 91·4	87·4
Lowest Reading of a Min. Therm. on the 27th 56·8	55·7
Range of Thermometer Readings..... 34·6	31·7
Greatest Range in 24 hours on the 5th..... 21·6	19·6
Mean of all the Highest Readings ..... 78·8	76·1
Mean of all the Lowest Readings ..... 65·5	64·3
Mean Daily Range ..... 13·8	11·8
Mean Temperature (deduced from Max & Min.) 71·3	69·3
Mean Temperature (deduced from Dry Bulb).. 69·9	86·4
Adopted Mean Temperature ..... 70·6	68·9
Mean Temperature of Evaporation..... 65·1	64·2
Mean Temperature of Dew Point..... 60·7	60·7
Mean elastic force of Vapour .....inches 0·531	0·536
Mean weight of Vapour in a cub. ft. of air grains 5·9	5·8
Mean additional weight required for saturation ,, 2·3	1·7
Mean degree of Humidity ..... 71	77
Mean weight of a cubic foot of air.....grains 520·1	523·4
Fall of Rain .....inches 3·302	3·013
Number of days on which Rain fell ..... 7	8
Mean amount of Cloud (an overcast sky=10.. 2·9	4·2
Total number of miles of Wind indicated .... 5983	6802
Mean Velocity of Wind per hour..miles..... 8·0	9·2

## NOVEMBER.

Results of Observations taken during the Month.	Mean for the last 10 years.
Mean Reading of the Barometer .....inches 30·000	30·076
Highest                   ,,           on the 29th   ,, 30·257	30·328
Lowest                   ,,           on the 18th   ,, 29·589	29·746
Range of Barometer Readings.....   ,, 0·668	0·582
Highest Reading of a Max. Therm. on the 1st 80·0	76·1
Lowest Reading of a Min. Therm. on the 26th 53·0	49·0
Range of Thermometer Readings..... 27·0	27·1
Greatest Range in 24 hours on the 1st ..... 16·8	18·5
Mean of all the Highest Readings ..... 71·5	68·0
Mean of all the Lowest Readings..... 61·0	56·9
Mean Daily Range ..... 10·5	11·1
Mean Temperature (deduced from Max. & Min) 65·2	61·7
Mean Temperature (deduced from Dry Bulb) 64·4	61·2
Adopted Mean Temperature ..... 64·8	61·5
Mean Temperature of Evaporation..... 60·1	56·9
Mean Temperature of Dew Point..... 56·1	53·8
Mean elastic force of Vapour.....inches 0·451	0·414
Mean weight of Vapour in a cub. ft. of air grains 5·0	4·7
Mean additional weight required for saturation,, 1·8	1·3
Mean degree of Humidity ..... 74	79
Mean weight of a cubic foot of air .. grains 528·4	532·6
Fall of Rain .....inches 3·374	3 305
Number of days on which Rain fell..... 9	10
Mean amount of Cloud (an overcast sky=10) 6 5	4·8
Total number of miles of Wind indicated.... 7317	6809
Mean Velocity of Wind per hour .....miles 10·2	9·5

## DECEMBER.

Results of Observations taken during the Month.	Mean for the last 10 years.
Mean Reading of the Ba o meter ....inches 29·937	30·070
Highest           ,,           ,, on the 16th   ,, 30·261	30·414
Lowest           ,,           ,, on the 22nd   ,, 29·520	29·582
Range of Barometer Readings..... 0·741	0·832
Highest Reading of a Max. Therm. on the 1st 69·9	68·5
Lowest Reading of a Min. Therm. on the 30th 41·1	44·0
Range of Thermometer Readings ..... 18·8	24·5
Greatest Range in 24 hours on the 21st ..... 17·4	17·2
Mean of all the Highest Readings ..... 61·0	62 0
Mean of all the Lowest Readings..... 52·8	52·2
Mean Daily Range ..... 8·2	9·8
Mean Temperature (deduced from Max. & Min.) 56·2	56·5
Mean Temperature (deduced from Dry Bulb) 56·3	56·0
Adopted Mean Temperature ..... 56·3	56·3
Mean Temperature of Evaporation ..... 51·7	51·9
Mean Temperature of Dew Point..... 48·1	48·7
Mean elastic force of Vapour.....inches 0·336	0·334
Mean weight of Vapour in a cub. ft. of air grains 3·8	3·9
Mean additional weight required for saturation ,, 1·2	1·1
Mean degree of Humidity ..... 76	79
Mean weight of a cubic foot of air ....grains 536·8	538 8
Fall of rain ..... inches 7·374	3·653
Number of Days on which Rain fell ..... 22	14
Mean amount of Cloud (an overcast sky=10.. 7·1	5·4
Total number of miles of Wind indicated .... 6924	8291
Mean Velocity of Wind per hour.....miles 9·3	11·2

## Summary of Observations

### FOR 1893.

Results of Observations taken during the Year.	Mean for the last 10 years.
Mean Reading of the Barometer..... inches	30·007
Highest                   ,,                   on April 16th                   ,,	30·386
Lowest                   ,,                   on Jan. 17th                   ,,	29·416
Range of Barometer Readings .....	0·970
Highest Reading of a Max. Therm. on Sept. 25th	98·8
Lowest Reading of a Min. Therm. on Jan. 19th	39·0
Range of Thermometer Readings .....	59·8
Greatest Range in 24 hours on August 28th ..	23·6
Mean of all the Highest Readings .....	73·0
Mean of all the Lowest Readings .....	59·6
Mean Daily Range .....	13·4
Mean Temperature (deduced from Max & Min)	65·5
Mean Temperature (deduced from Dry Bulb)	64·7
Adopted Mean Temperature .....	65·1
Mean Temperature of Evaporation .....	60·0
Mean Temperature of Dew Point.....	56·5
Mean elastic force of Vapour .....inches	0·475
Mean weight of Vapour in a cub. ft. of air grains	5·2
Mean additional weight required for saturation ,,	1·9
Mean degree of Humidity .....	75
Mean weight of a cubic foot of air ....grains	56·9
Fall of Rain .....	25·283
Number of Days on which Rain fell.....	80
Mean amount of Cloud (an overcast sky:=10)..	3·9
Total number of miles of Wind indicated ....	79562
Mean Velocity of Wind per hour.....miles	9·1

The Maximum monthly mean height of the Barometer was  
in November, 1889, and was .....inches 30·249  
The Minimum ‘ , , in January, 1886, and was 29·844

The Maximum yearly mean height of the Barometer was in 1884, and was .....	inches	30·057
The Minimum ,, ,, in 1893, and was .....	,,	30·007
The greatest monthly range of the Barometer was in January, 1886, and was .....		1·201
The least ,, ,, in August, 1883, and was.....		0·188
The highest reading of the Barometer, during 5 years, was on January 26th, 1887, and was .....		30·627
The lowest ,, ,, on 17th, January 1886, and was..		29·155
Extreme range .....		1·472
The highest temperature was on July 20th, 1889, and was..		104·1
The lowest ,, ,, February 20th, 1891..		87·7
The highest mean temperature of a month was in August, 1887, and was .....		83·2
The lowest ,, ,, February, 1891, and was		49·5
The greatest monthly mean weight of vapour, } in a cubic foot of air .....grains }	August, 1855	7·9
The least ,, ,, January and February, 1891, and was..gr		8·0
The highest observed Dew point was on the 30th August, 1885, and was .....		78·7
The lowest ,, ,, 19th January, 1891, and was		28·6
The greatest fall of rain in a month, was in December, 1889, and was .....	inches	8·952
The greatest number of days on which } rain fell in one month ....days }	January, 1889....	24
The highest temperature registered in sunshine was on the 20th July, 1889, and was .....		158·8
The lowest temperature registered on ground was on the 25th January, 1891, and was .....		32·5
The highest observed sea temperature was on the 5th August, 1887, and was.....		85·0
The lowest ,, ,, 28rd January, 1891, and was		56·0
The smallest mean amount of cloud observed in one month was in August, 1890, and was .....		0·0
The greatest ,, ,, in December, 1893, and was		7·1

## NOTES FOR THE SEPARATE MONTHS.

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### JANUARY.

THE Dew-point ranged between  $54.0^{\circ}$  on the 11th and  $29.0^{\circ}$  on the 23rd.

In Sunshine, the highest reading was  $106.5^{\circ}$  on the 19th.

On ground, the lowest reading was  $36.5^{\circ}$  on the 6th.

Thunderstorms passed on the 4th, 13th and 16th.

Hail fell on the 2nd, 3rd, 4th, 5th, 17th, 18th, 22nd and 24th.

Total Rainfall since last June 21.386 inches ;

the average of 5 years, 14.795 inches.

Pressure has been unusually low, and rainfall nearly double the average.

### FEBRUARY.

The Dew-point ranged between  $32.7^{\circ}$  on the 8th &  $54.7^{\circ}$  on the 28th.

In Sunshine, the highest reading was  $122.1^{\circ}$  on the 26th.

On Ground, the lowest reading was  $36.3^{\circ}$  on the 8th.

Lightning was seen on the 4th and 23rd.

Total Rainfall since last June, 23.154 inches

the average of 10 years, 16.882 inches

### MARCH.

The Dew-point ranged between  $56.6^{\circ}$  on the 17th and  $34.8^{\circ}$  on the 20th.

In Sunshine, the highest reading was  $129.2^{\circ}$  on the 25th.

On Ground, the lowest reading was  $38.0^{\circ}$  on the 22nd.

Thunderstorms passed on the 2nd.

Lightning was seen on the 7th and 25th.

Total Rainfall since last June 25.422 inches ;

the average of 10 years, 17.778 inches



## APRIL.

The Dew-point ranged between  $38.7^{\circ}$  on the 12th and  $60.3^{\circ}$  on the 28rd.

In Sunshine, the highest reading was  $134.1^{\circ}$  on the 28th.

On Ground, the lowest reading was  $41.9^{\circ}$  on the 18th.

Lightning was seen on the 9th.

Total Rainfall since last June 25.669 inches ;

the average of 10 years, 18.546 inches.

## MAY.

The Dew-point ranged between  $51.6^{\circ}$  on the 14th and  $62.9^{\circ}$  on the 21st.

In Sunshine, the highest reading was  $137.3$  on the 31st.

On Ground, the lowest reading was  $47.0^{\circ}$  on the 8th.

Total Rainfall since last June 25.816 inches ;

the average of 10 years, 19.307.

## JUNE.

The Dew-point ranged between  $56.3^{\circ}$  on the 3rd and  $68.7^{\circ}$  on the 24th.

In Sunshine, the highest reading was  $141.4^{\circ}$  on the 26th.

On Ground, the lowest reading was  $54.5^{\circ}$  on the 10th.

Thunderstorms passed on the 2nd and 10th.

Hail fell on the 2nd.

## JULY,

The Dew-point ranged between  $57.6^{\circ}$  on the 1st and  $73.1^{\circ}$  on the 28th.

In Sunshine the highest reading was  $146.9^{\circ}$  on the 14th.

On Ground, the lowest reading was  $60.8^{\circ}$  on the 20th.

On the 29th, at 10-30 a.m., a few heavy drops of rain fell, not enough to measure.

**AUGUST.**

The Dew-point ranged between  $59.7^{\circ}$  on the 1st, and  $74.0^{\circ}$  on the 29th.

In Sunshine, the highest was  $148.8^{\circ}$  on the 31st.

On Ground, the lowest reading was  $60.8$  on the 11th.

Lightning was seen on the 6th.

**SEPTEMBER.**

The Dew-point ranged between  $51.6^{\circ}$  on the 25th at 2-0 p.m., and  $75.8^{\circ}$  on the 20th at 8-0 a.m.

In Sunshine, the highest reading was  $147.9^{\circ}$  on the 20th.

On Ground, the lowest reading was  $60.0^{\circ}$  on the 6th.

Total Rainfall since last June .030 inches on August 6th.

The hottest month of this year, and hotter than any previous September of last ten years. Total absence of rain never before recorded in last ten years. High dew-point has made weather very trying

**OCTOBER.**

The Dew-point ranged between  $71.9^{\circ}$  on the 1st and  $53.2^{\circ}$  on the 30th.

In Sunshine, the highest reading was  $144.6^{\circ}$  on the 2nd.

On Ground, the lowest reading was  $51.0^{\circ}$  on the 27th.

Thunderstorms passed on the 20th, 21st, 22nd, 23rd and 28th.

Lightning was seen on the 3rd, 24th, 29th and 30th.

Total Rainfall since last June 3.232 inches ;

the average of 10 years, 4.537 inches.

**NOVEMBER.**

The Dew-point ranged between  $67.2^{\circ}$  on the 9th and  $47.3^{\circ}$  on the 20th.

In Sunshine, the highest reading was 127.2 on the 23rd.

On Ground, the lowest reading was  $48.1^{\circ}$  on the 26th.

Thunderstorms passed on the 13th, 14th, and 17th.

Lightning was seen on the 6th, 9th, 10th, 11th, 15th, 16th, 18th, 30th.

Total Rainfall since last June 6·706 inches ; the average of 10 years, 7·842 inches.

The month has been marked by an unusually variable barometer. The sky has been unusually overcast, whilst the rainfall for the month only slightly exceeds the average.

#### DECEMBER.

The Dew-point, ranged between  $59\cdot2^{\circ}$  on the 1st and  $35\cdot4^{\circ}$  on the 30th.

In Sunshine, the highest reading was  $126\cdot2^{\circ}$  on the 3rd.

On Ground, the lowest reading was  $37\cdot5$  on the 30th.

The Sea has fallen to  $61\cdot0^{\circ}$ .

Thunderstorms passed on the 1st, 6th, 7th, 8th, 20th and 22nd

Lightning was seen on the 5th, 23rd, 25th, 26th, 28th and 29th.

Hail fell on the 7th, 8th and 22nd.

Total Rainfall since last June 14·080 inches ;

the average of 10 years, 11·495 inches.

The month has been unusually overcast and rainy, with much less than the average amount of wind.

#### NOTES FOR THE YEAR.

The Dew-point ranged between  $29\cdot0^{\circ}$  on the 23rd January, and  $75\cdot8$  on the 20th September.

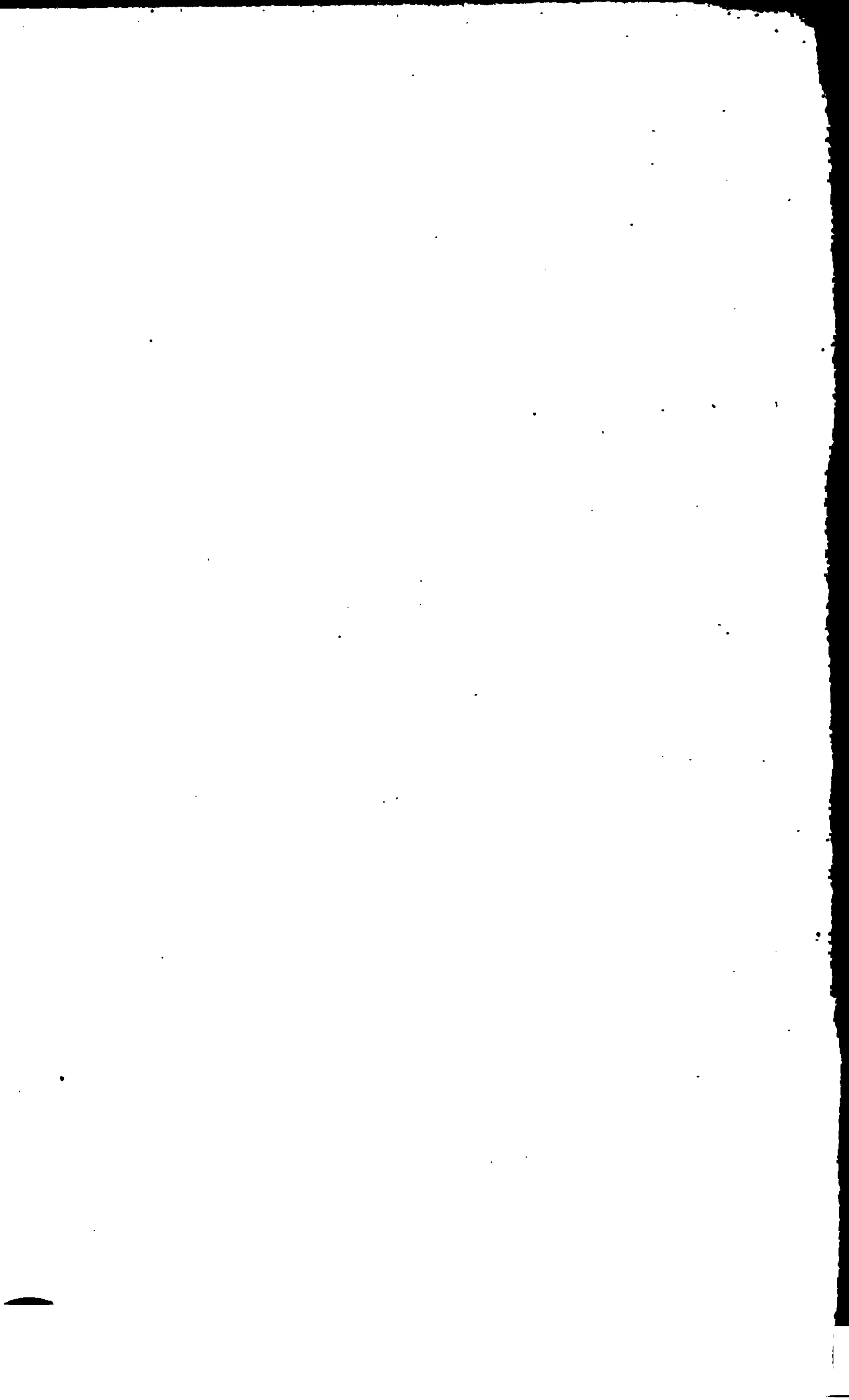
In Sunshine, the highest reading was  $148\cdot8^{\circ}$  on the 31st Aug.

On Ground, the lowest reading was  $36\cdot3^{\circ}$  on the 8th Feb.

Thunderstorms passed on 20 days.

Lightning was seen on 26 days.

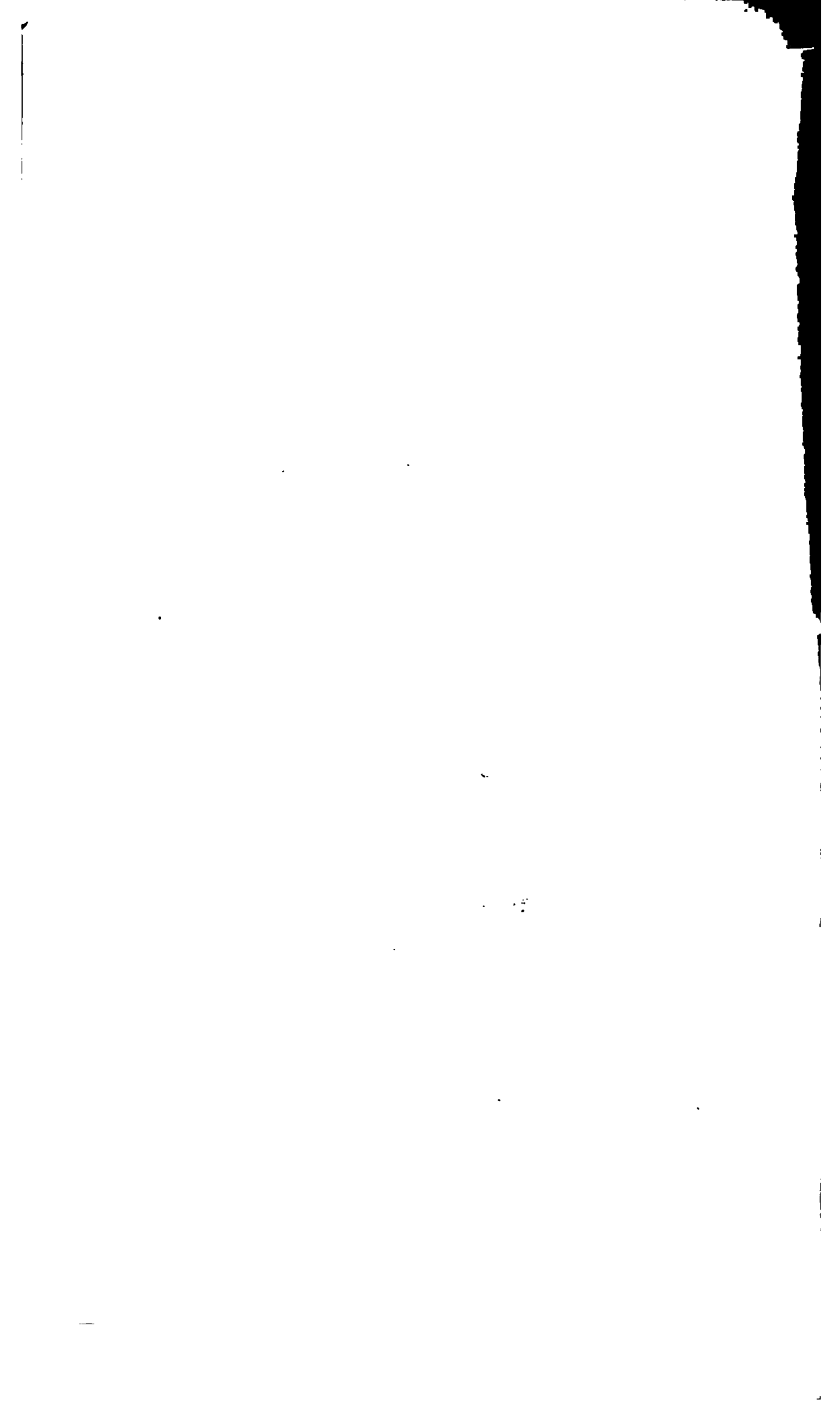
Hail fell on 12 days.













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S

AGNETICA

AND

# SOLAR OBSERVATIONS

BY THE

REV. W. SIDGREAVES, S.J., F.R.A.S.

1894.

CLITHEROE:

PRINTED BY PARKINSON & BLACOW, TIMES OFF

1895.



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## INTRODUCTION.

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The work of the Meteorological and Magnetical department of the Observatory has been carried on as described in the introduction to the report of 1892. It was there mentioned that the recording apparatus of the Robinson Anemometer had not been working satisfactorily. It was sent to R. Munro, Engineer, of London, on April 9th, and was replaced by another of the same dimensions on August 5th. The usual wind-synopsis is, therefore, wanting in our weather reports of these and the intervening months.

The annual inspection of the Meteorological instruments belonging to the Board of Trade, was made on the 18th and 19th of September, by Mr. Baker, of the Kew Observatory.

The heavy gale of December 22nd, gave us our highest recorded velocity, at 72 miles an hour. The details of the storm are given in the December report, page 31.

The scale co-efficient of the Bifilar magnetometer was tested again in October, as in the previous year, and was found to have suffered no appreciable change. The exact value of one centimeter displacement of the spot of light upon the photographic paper

is now,	1894,	0.000512	C.G.S. units
and was in	1893,	0.000511	"
and in	1892,	0.000515	"

The most remarkable disturbance of the magnets during the year occurred on November 13, beginning abruptly at 2 p.m. A comparison with the Kew record of the same disturbances shows that the changes of force

and direction were much greater at Stonyhurst than at Kew, from 3 p.m. to midnight. At 8-15 p.m. a very sudden increase of horizontal force was shown by the Bifilar magnetometer, the spot of light moving off through 6.0 centimeters and back again in five minutes, and continuing its rapid movement, responding to decreasing force, through 4.6 centimeters in another two minutes, when it left the cylinder and did not return for 20 minutes. If we suppose that the rest of this movement as closely resembled that of the smaller oscillation at Kew, as the recorded part of it, the complete swing of the light-spot, from maximum to minimum of force, would be through 15.2 centimeters in 12 minutes, just three times that of the Kew curve. The Unifilar magnetograph shows also considerably greater changes of direction at Stonyhurst than at Kew.\* Smooth curves drawn through the oscillations would show, in general, westerly deflection corresponding with increase of horizontal force; but many of the quicker oscillations show decrease of force with westerly deflection.

The subject has been mentioned, informally, at a meeting of the Royal Astronomical Society; and it is hoped that the means may be found by one or more of the Scientific Societies for the multiplication of Magnetic Observatories, with the object of determining, for the greater disturbances, the terrestrial position of maximum effect. To know this, is a necessary step for the advancement of our knowledge about the causes of these unexplained storms; and a single instrument of simple make, the Unifilar magnetograph, at each station would be enough for the purpose.

The interruption of the Solar Chromospheric measurements, mentioned in our report of last year, has led to its discontinuance, on the grounds that the work is being carried on at Rome under much more favourable conditions by Professor Tacchini, and that in the varying state of our own inconstant climate, the average length of the chromospheric line C appears to be as much a measure of the transparency of our atmosphere as of the depth of the Solar chromosphere.

\* The Bifilar instruments at the two observatories are practically of the same sensibility, the one at Kew being a trifle more sensitive. The Unifilar at Kew is more sensitive than the Stonyhurst instrument in the proportion of 11 3/8 to 7.

The drawings of the Sun spots and faculæ have been continued as formerly, notwithstanding the completeness of the series of photographic pictures of them collected at Greenwich ; because there is reason to believe that the visual and photographic images are not identical.

Our conclusions from a study of the Solar Drawings, made during 1889, the year of least spot-frequency, of the magnetic curves of the same period, and of our recent photographs of the spectra of Sun-spots and faculæ, have been given in a communication to the Royal Astronomical Society, published in the November number of the Monthly Notices.

The entire collection of Sun spot drawings is now under examination, with the object of testing the Wilson Theory of "Cavities." The work of mapping the spectra of the brighter stars from the photographic plates, obtained with the old 8 inch-objective of the Equatorial telescope, is nearly complete. The results of both these studies will also be communicated to the R. A. S. when ready.

The stellar work of the Father Perry-Memorial-objective has been carried on without the loss of any available clear night, and the large number of photographs of the spectra of stars, made during the year, shows our gain in time by the greater aperture. But only a few of these plates will be of service for future study ; all the work having been expended upon a long series of experiments connected with the perfection of our small photo-spectrograph. The photographs have been from the beginning stronger, and have extended further into the violet end of the spectrum, than was possible with the 8 inch glass ; but it is only recently that the sharpness of the definition has been brought up to match the delicate markings on the photographs given by the old objective. These experiments and their results will be given in detail when complete. But it may be mentioned here, to guard against misinterpretation, that in our method of photographing the spectra of stars, without a slit, it was not expected that the greater light power and longer focal length of the new glass would give as perfect definition as the weaker instrument when employed upon a star of sufficient brightness.

WALTER SIDGREAVES, S.J.

# Stonyhurst Observatory.

Lat. 53° 50' 40" N. Long. 9m. 52s. 68w. Height of the Barometer  
above the sea 381ft.

## METEOROLOGICAL REPORT.

JANUARY, 1894.

Results of Observations taken during the Month.		Mean for the last 47 years.
Mean Reading of the Barometer .....	29·327	29·439
Highest                   ,,           on the 3rd.....	30·241	30·281
Lowest                   ,,           on the 20th ....	28·824	28·587
Range of Barometer Readings.....	1·417	1·694
Highest Reading of a Max. Therm. on the 11th	52·8	51·6
Lowest Reading of a Min. Therm. on the 5th	10 0	20·4
Range of Thermometer Readings .....	42·8	31·2
Mean of all the Highest Readings .....	42·9	42·2
Mean of all the Lowest Readings.....	31·3	32·5
Mean Daily Range .....	11·6	9·7
Deduced Monthly Mean (from Mean of Max. and Min.) .....	36·9	37·1
Mean Temperature from Dry Bulb.....	37·4	37·1
Adopted Mean Temperature.....	37·2	37·1
Mean Temperature of Evaporation.....	35·6	35·9
Mean Temperature of Dew Point .....	33·3	33·8
Mean elastic force of Vapour.....	0·191 in	0·195 in
Mean weight of Vapour in a cub. ft. of air ..	2·2 gr	2·4 gr
Mean additional weight required for saturation	0·4 gr	0·4 gr
Mean degree of Humidity (saturation 1·00) ..	0·86	0·86
Mean weight of a cubic foot of air .....	547·4 gr	549·5 gr
Fall of rain .....	4·617 in	4·141 in
Number of Days on which rain fell .....	28	19·8



## JANUARY, 1894.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	1	6	7	2	7	6	1
Mean Velocity in miles per hour	7.9	9.3	10.1	14.1	18.0	16.3	18.8	4.8
Total No. of miles for each Direction	189	222	1452	2372	863	2739	2710	114

The total No. of miles registered during the month was 10661.

The max. Velocity of the wind was 45 miles per hour. Direction S by E. on the 29th at 9 p m.

Mean amount of Cloud (an overcast sky being indicated by 10.0) 8.3

In the month of January, the highest reading of the Barom-

eter during 47 years, was on the 18th in 1882, and was 30.480

The lowest ,, 26th, 1884 ,, .... 27.803

The highest Temperature 7th, 1887 ,, .... 59.9

The lowest ,, 15th, 1881 ,, .... 4.6

The highest adopted mean temperature of the month, 1875 42.5

The lowest ,, ,, 1881.... 29.2

January opened this year, as last year, with a very cold week. The coldest period of the frost covered the three days, 5th, 6th, and 7th; during which the highest temperature was 27°, the lowest 10°, and the mean temperatures approximately 19°, 20°, and 21°. The barometer stood high during the first 4 days; it then fell below the annual mean, and remained low for the rest of the month, with short oscillations, never reaching 29.7 inches, and only 5 times rising above 29.5. Ground frost on 17 days. Snow on 10 days. Hail on 3 days.

## FEBRUARY, 1894.

Results of Observations taken during the Month		Mean for the last 47 years.
Mean Reading of the Barometer.....	29.482	29.506
Highest                   ,,           on the 18th....	30.116	30.064
Lowest                   ,,           on the 11th....	28.376	28.681
Range of Barometer Readings.....	1.740	1.383
Highest Reading of a Max. Therm. on the 7th	53.6	52.1
Lowest Reading of a Min. Therm. on the 18th	23.5	22.4
Range of Thermometer Readings .....	30.1	29.7
Mean of all the Highest Readings.....	45.6	44.3
Mean of all the Lowest Readings .....	33.7	33.6
Mean Daily Range.....	11.9	10.7
Deduced Monthly Mean (from Mean of Max. and Min ).....	39.8	38.4
Mean Temperature from Dry Bulb.....	39.9	38.4
Adopted Mean Temperature .....	39.6	38.4
Mean Temperature of Evaporation .....	37.9	36.9
Mean Temperature of Dew Point .....	35.7	34.7
Mean elastic force of Vapour .....	0.210in	0.193in
Mean weight of Vapour in a cub. ft. of air ....	2.4gr	2.4gr
Mean additional weight required for saturation	0.4gr	0.4gr
Mean degree of Humidity (saturation 1.00 ..)	0.86	0.87
Mean weight of a cubic foot of air.....	547.6gr	548.6gr
Fall of Rain.....	6.783in	3.556in
Number of days on which Rain fell .....	23	17.2

No of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	3	2	1	2	8	12	0
Mean Velocity in miles per hour	0	4.0	6.6	9.2	11.3	17.5	18.4	0
Total No. of miles for each Direction	0	291	315	220	542	3358	5299	0

The total number of miles registered during the month was 10025.  
The max. Velocity of the wind was 59 miles per hour. Direction W., at 5 a.m., on the 12th.

# FEBRUARY, 1894.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				8·1
In the month of February, the highest reading of the Barometer during 47 years, was on the 11th, in 1849, and was ..				30·452
The lowest	„	6th, 1867	„	.... 28·208
The highest Temperature		8th, 1877	„	.... 58·3
The lowest	„	18th, 1892	„	.... 8·1
The highest adopted mean temperature of the month, 1869....				44·0
The lowest	„	„	1855....	28·6

---

A wet month, with nearly double the average rainfall. The heaviest fall,  $1\frac{1}{2}$  inch, occurred on the 10th, preceding the gale of 11th, 12th. The barometer reached its lowest reading 28·376 between the rain and the wind storms ; but the weather had been generally rough from the 5th. Ground frost on 18 days. Snow on 3 days. Aurora borealis seen on 2 days.

# MARCH, 1894.

Results of Observations taken during the month.		Mean for the last 47 years.
Mean Reading of the Barometer .....	29·477	29·474
Highest                   ,,                   on the 23rd.....	30·091	30·083
Lowest                   ,,                   on the 13th.....	28·370	28·685
Range of Barometer Readings .....	1·721	1·398
Highest Reading of a Max. Therm. on the 27th	65·3	57·2
Lowest Reading of a Min. Therm. on the 16th	25·0	22·4
Range of Thermometer Readings.....	40·3	34·9
Mean of all the Highest Readings .....	52·9	47·2
Mean of all the Lowest Readings .....	34·7	34·0
Mean Daily Range .....	18·2	13·2
Deduced Monthly Mean (from Mean of Max. and Min.) .....	42·8	39·7
Mean Temperature from dry bulb.....	43·1	39·9
Adopted Mean Temperature.....	43·0	39·8
Mean Temperature of Evaporation .....	40·6	37·9
Mean Temperature of Dew Point .....	37·7	35·4
Mean elastic force of Vapour .....	0·226in	0·205in
Mean weight of Vapour in a cub. ft. of air.....	2·6gr	2·4gr
Mean additional weight required for saturation...	0·6gr	0·5gr
Mean degree of Humidity (saturation 1·00) ...	0·82	0·85
Mean weight of a cubic foot of air .....	543·7gr	546·7gr
Fall of Rain .....	3·902in	3·094in
Number of days on which Rain fell .....	14	17·3

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	6	3	1	2	4	14	1
Mean Velocity in miles per hour	0	6·1	4·5	7·1	18·1	16·6	13·5	2·5
Total No. of miles for each Direction.	0	876	322	170	867	1590	4530	59

The total number of miles registered during the month was 8414.  
The max. Velocity of the wind was 47 miles per hour. Direction S.S.W., on the 1st, at 9 a.m.

## MARCH, 1894.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				5·8
In the month of March, the highest reading of the Barometer during 47 years, was on the 6th, in 1852, and was ..				
				30·401
The lowest	„	31st, 1860	„	.. 28·199
The highest Temperature	„	25th, 1871	„	.. 68 0
The lowest	„	„ 6th, 1886	„	.. 11·5
The highest adopted mean temperature of the month, 1871..				44·0
The lowest	„	„ 1855 and 1892	..	35·6

---

An average month except for the temperature, which was 3·2 above the mean. The rainfall was nearly all in the first half of the month, with a generally low barometric pressure; the latter half being fine with high barometer readings.

Ground frost on 23 days. Snow once. Hail on 5 days. Fine Aurora borealis seen on the 30th.

## APRIL, 1894.

Results of Observations taken during the Month.		Mean for the last 47 years.
Mean Reading of the Barometer .....	29.443	29.485
Highest ,, on the 30th ....	29.945	29.969
Lowest ,, on the 16th ....	28.839	28.804
Range of Barometer Readings .....	1.106	1.165
Highest Reading of a Max. Therm. on the 11th	68.6	66.2
Lowest Reading of a Min. Therm. on the 19th	31.1	28.1
Range of Thermometer Readings .....	37.5	38.1
Mean of all the Highest Readings.....	57.9	55.9
Mean of all the Lowest Readings .....	40.1	37.8
Mean Daily Range.....	17.8	18.1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	47.5	44.4
Mean Temperature from Dry Bulb .....	47.6	44.6
Adopted Mean Temperature .....	47.6	44.5
Mean Temperature of Evaporation .....	44.6	41.7
Mean Temperature of Dew Point .....	41.3	38.1
Mean elastic force of Vapour .....	0.260in	0.235in
Mean weight of Vapour in a cub. ft. of air ..	8.0gr	2.7gr
Mean additional weight required for saturation	0.7gr	0.7gr
Mean degree of Humidity (saturation 1.00) ..	0.79	0.80
Mean weight of a cubic foot of air.....	537.9gr	542.0gr
Fall of Rain.....	1.925in	2.258in
Number of Days on which rain fell .....	18	14.6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	11	5	3	4	3	2	0
Mean Velocity in miles per hour	7.0	14.2	9.8	15.0	14.9	6.1	3.2	
Total No. of miles for each Direction								

Anemograph dismounted.

The numbers in the table are the means of eye observations taken daily at 8, 9, and 10 a.m. noon, 2, 4, and 9 p.m.

## APRIL, 1894.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				6·9
In the month of April, the highest reading of the Barometer during 47 years, was on the 17th, in 1887, and was.....				
				30·251
The lowest	„	20th, 1868	„	..... 28·358
The highest Temperature		14th, 1852	„	..... 74·1
The lowest	„	13th, 1892	„	..... 20·8
The highest adopted mean temperature of the month, 1865 ....				48·5
The lowest	„	„	1879 ....	40·7

---

The mean temperature shows a comparatively warm month ; but it was a degree less than in April of last year, while the rainfall was an inch more on fewer days. The general changes of barometric pressure are shown by three wave crests about the 5th, 20th, and 30th, with low hollows about the 16th and 26th. Ground frost on 12 days. Hail on one day. Lunar halo on one day.

## MAY, 1894.

Results of Observations taken during the Month.		Mean for the last 47 years.
Mean Reading of the Barometer.....	29·532	29·505
Highest                   ,,           on the 24th.....	30·044	29·944
Lowest                   ,,           on the 28th.....	29·092	28·940
Range of Barometer Readings.....	0·952	1·004
Highest Reading of a Max. Therm. on the 25th	64·4	71·9
Lowest Reading of a Min. Therm. on the 20th	27·0	31·3
Range of Thermometer Readings .....	37·4	40·6
Mean of all the Highest Readings .....	56·9	59·7
Mean of all the Lowest Readings .....	38·6	42·0
Mean Daily Range .....	18·3	17·7
Deduced Monthly Mean (from Mean of Max. and Min.) .....	46·1	49·0
Mean Temperature from Dry Bulb.....	47·0	49·5
Adopted Mean Temperature .....	46·6	49·3
Mean Temperature of Evaporation .....	42·8	46·1
Mean Temperature of Dew Point .....	38·6	42·5
Mean elastic force of Vapour .....	0·233in	0·276in
Mean weight of Vapour in a cub. ft. of air ....	2·7gr	2·3gr
Mean additional weight required for saturation	1·0gr	0·9gr
Mean degree of Humidity (saturation 1·00)..	0·74	0·76
Mean weight of a cubic foot of air.....	540·6gr	537·0gr
Fall of Rain .....	3·158in	2·635 in
Number of days on which Rain fell.....	22	15·4

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	4	8	1	2	0	5	9	2
Mean Velocity in miles per hour	5·0	9·4	10·0	12·3	0	13·2	14·3	13·0
Total No. of miles for each Direction								

Anemograph Dismounted.

The numbers in the table are the means of eye observations taken daily at 8, 9, and 10 a.m. Noon, 2, 4, and 9 p.m.



## MAY, 1894.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·6

In the month of May, the highest reading of the Barometer

during 47 years, was on the 22nd in 1855, and was ..... 30·124

The lowest                   ,,           28th, 1877                   ,,           ..... 28·559

The highest Temperature   19th, 1864                   ,,           ..... 82·5

The lowest                   ,,           4th, 1855                   ,,           ..... 23·5

The highest adopted mean temperature of the month, 1848 .... 55·1

The lowest                   ,,                                   ,,                                   1855 .... 45 0

---

A cold wet month, beginning with a high but falling barometer. The falling continued till the 10th, when a fairly steady rise set in, and settled at a high pressure state from the 16th to the 25th with fine but cold weather. Ground frost on 13 days. Snow on one day. Hail on one day. Solar halo on one day.

## JUNE, 1894.

Results of Observations taken during the Month.		Mean for the last 47 years.
Mean Reading of the Barometer .....	29·577	29·541
Highest                   ,,                   on the 30th.....	30·033	29·894
Lowest                   ,,                   on the 2nd.....	29·161	29·033
Range of Barometer Readings .....	0·872	0·861
Highest Reading of a Max. Therm. on the 3rd	79·5	77·3
Lowest Reading of a Min. Therm. on the 6th	35·6	38·8
Range of Thermometer Readings .....	43·9	38·5
Mean of all the Highest Readings .....	65·7	65·7
Mean of all the Lowest Readings .....	47·6	47·9
Mean Daily Range .....	18·1	17·8
Deduced Monthly Mean (from Mean of Max. and Min ) .....	54·9	55·0
Mean Temperature from Dry Bulb.....	54·2	55·0
Adopted Mean Temperature.....	54·6	55·0
Mean Temperature of Evaporation .....	51·1	52·0
Mean Temperature of Dew Point .....	47·8	48·6
Mean elastic force of Vapour .....	0·330in	0·354 in
Mean weight of Vapour in a cub. ft. of air.....	3·8gr	3·9gr
Mean additional weight required for saturation..	1·1gr	0·9gr
Mean degree of Humidity (saturation 1·00) ..	0·77	0·79
Mean weight of a cubic foot of air .....	532·4gr	531·2gr
Fall of Rain .....	3·625 in	3·622 in
Number of days on which Rain fell.....	18	16·2

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	6	1	1	1	9	7	4
Mean Velocity in miles per hour	5·2	10·3	7·4	3·6	6·3	15·8	8·7	12·6
Total No. of miles for each direction								

Anemograph Dismounted.

The numbers in the table are the means of eye observations taken daily at 8, 9, and 10 a.m. Noon, 2, 4, and 9 p.m.

## JUNE, 1894.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·7

In the month of June, the highest reading of the Barometer during 47 years, was on the 15th, in 1874, and was..... 30·219

The lowest „ 23rd, 1893 „ ..... 28·813

The highest Temperature 18th, 1893 „ ..... 88·7

The lowest „ 17th, 1892 „ ..... 84·1

The highest adopted mean temperature of the month, 1858... 59·0

The lowest „ „ 1856 and 1860... 52·2

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The first half of the month was wet, with lower readings of the barometer and thermometer. Fine and warm weather came with the generally higher pressure in the second half. But only the last five days showed a steady high barometer ; and these were very warm days, the maximum temperatures of the air increasing daily from 71°·2 to 79°·5.

## JULY, 1894.

Results of Observations taken during the Month		Mean for the last 47 years.
Mean Reading of the Barometer .....	29·447	29·502
Highest                    "                   on the 1st .....	29·955	29·879
Lowest                    "                   on the 12th.....	28·870	28·991
Range of Barometer Readings .....	1·085	0·888
Highest Reading of a Max. Therm. on the 1st	80·5	78·8
Lowest Reading of a Min. Therm. on the 13th	43·2	42·1
Range of Thermometer Readings .....	37·3	36·7
Mean of all the Highest Readings .....	70·2	67·8
Mean of all the Lowest Readings. ....	51·3	50·7
Mean Daily Range .....	18·9	17·1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	59·0	57·7
Mean Temperature from Dry Bulb.....	58·2	57·8
Adopted Mean Temperature .....	58·6	57·8
Mean Temperature of Evaporation .....	55·4	54·8
Mean Temperature of Dew Point.....	52·6	52·1
Mean elastic force of Vapour.....	0·396 in	0·389 in
Mean weight of Vapour in a cubic ft. of air ....	4·4 gr	4·5 gr
Mean additional weight required for saturation	1·1 gr	1·0 gr
Mean degree of Humidity (saturation 1·00) ..	0·80	0·82
Mean weight of a cubic foot of air .....	526·9 gr	527·3 gr
Fall of Rain :.....	4·329 in	4·224 in
Number of days on which Rain fell.....	18	18·1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	4	3	2	2	9	10	0
Mean Velocity in miles per hour	10·3	11·4	11·6	8·6	5·0	13·4	21·2	0
Total No. of miles for each Direction								

Anemograph dismantled.

The numbers in the table are the means of observations taken daily at 8, 9, and 10 a.m., noon, 2, 4, and 9 p.m.

## JULY, 1894.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·5

In the Month of July, the highest reading of the Barometer

during 47 years, was on the 24th, in 1868, and was ..... 30·112

The lowest                   ,,           15th, 1877           ,,           ..... 28·564

The highest Temperature   22nd, 1873           ,,           ..... 88·2

The lowest                   ,,           1st, 1857           ,,           ..... 36·0

The highest adopted mean temperature of the month, 1852 ..... 63·0

The lowest                   ,,                                   1888 ..... 54·5

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The high barometric pressure at the end of last month fell steadily at an average rate of 0·1 inch, to the lowest reading of the month on the 12th. Rain fell on four of these days to the amount of 1·16 inch ; but no rain fell on the 10th or 11th, and only 0·2 inch fell during the low pressure condition from the 10th to the 14th inclusive. The barometer remained fluctuating below 29·5 till the 22nd, and between 29·5 and 29·72 the rest of the month.

## AUGUST, 1894.

Results of Observations taken during the Month		Mean for the last 47 years
Mean Reading of the Barometer.....	29·463	29·488
Highest                   ,,                   on the 29th ....	29·854	29·885
Lowest                   ,,                   on the 15th ....	28·893	28·947
Range of Barometer Readings .....	0·961	0·938
Highest Reading of a Max. Therm. on the 8th	68·9	77·0
Lowest Reading of a Min. Therm. on the 20th	40·0	41·2
Range of Thermometer Readings .....	28·9	35·8
Mean of all the Highest Readings.....	64·1	67·2
Mean of all the Lowest Readings .....	49·8	56·4
Mean Daily Range.....	14·3	16·8
Deduced Monthly Mean (from Mean of Max. and Min.) ..	55·5	57·1
Mean Temperature (deduced from Dry Bulb)	55·7	57·5
Adopted Mean Temperature .....	55·6	57·3
Mean Temperature of Evaporation ..	53·2	54·5
Mean Temperature of Dew Point .....	51·0	51·8
Mean elastic force of Vapour .....	0·375 in	0·387 in
Mean weight of Vapour in a cub. ft. of air ...	4·2 gr	4·3 gr
Mean additional weight required for saturation	0·8 gr	0·9 gr
Mean degree of Humidity (saturation 1·00)...	0·84	0·82
Mean weight of a cubic foot of air .....	529·1 gr	527·4 gr
Fall of Rain .....	8·377 in	5·069 in
Number of days on which Rain fell .....	23	19·1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	4	2	0	0	0	10	15	0
Mean Velocity in miles per hour	6·8	6·2	0	0	0	9·8	11·7	0
Total No. of miles for each Direction.	649	491	0	0	0	2350	4209	0

The total number of miles registered during the month was 7699.  
The max. Velocity of the wind was 30 miles per hour. Direction W.S.W. on the 15th at noon.

## AUGUST, 1894.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	8·9
In the month of August, the highest reading of the Barometer	
during 47 years, was on the 21st, in 1874, and was	..... 30·114
The lowest	„ 31st, 1876 „ ..... 28·555
The highest Temperature	2nd, 1868 „ ..... 88·0
The lowest	„ 13th, 1887 „ ..... 33·4
The highest adopted mean temperature of the month, 1857 & '84	61·0
The lowest	„ „ 1848 .... 52·5

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A very wet month. Over an inch of rain fell on the 1st and 14th, nearly an inch on the 2nd and 8th, and over  $\frac{1}{2}$  an inch on the 12th, 19th, and 25th. The barometer remained generally low till the 24th, when it rose above 29·7 inches for the first time, and remained steady with finer weather to the end of the month. The weather generally was colder than would appear from the mean temperature, the highest temperature in the shade being 8° below the average maximum, and the solar radiation thermometer showing a mean daily maximum only 3° higher than that of April.

# SEPTEMBER, 1894.

Results of Observations taken during the Month.		Mean for the last 47 years.
Mean Reading of the Barometer .....	29.773	29.518
Highest                    "                   on the 30th ....	30.130	30.026
Lowest                    "                   on the 25th.....	29.343	28.854
Range of Barometer Readings .....	0.787	1.172
Highest Reading of a Max. Therm. on the 15th	69.2	72.4
Lowest Reading of a Min. Therm. on the 27th	31.0	36.4
Range of Thermometer Readings .....	38.2	36.0
Mean of all the Highest Readings.....	62.1	62.2
Mean of all the Lowest Readings.....	44.4	46.9
Mean Daily Range .....	17.7	15.3
Deduced Monthly Mean (from Mean of Max. and Min.) .....	52.0	53.4
Mean Temperature from dry bulb .....	52.0	54.0
Adopted Mean Temperature .....	52.0	53.7
Mean Temperature of Evaporation .....	48.6	50.9
Mean Temperature of Dew Point ..	45.1	48.3
Mean elastic force of Vapour .....	0.301in	0.338in
Mean weight of Vapour in a cub. ft. of air ....	3.4gr	4.0gr
Mean additional weight required for saturation	1.0gr	0.8gr
Mean degree of Humidity (saturation 1.00)	0.78	0.82
Mean weight of a cubic foot of air .....	530.0gr	532.4gr
Fall of Rain .....	0.801in	4.599 in
Number of Days on which rain fell .....	6	17.9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	12	9	3	0	0	1	4	1
Mean Velocity in miles per hour	5.2	5.7	8.5	0	0	5.4	7.8	12.3
Total No. of miles for each Direction	1500	1239	612	0	0	130	750	294

The total number of miles registered during the month was 4525.  
The max. Velocity of the wind was 24 miles per hour. Direction E.N.E., on the 22nd, at 10 p.m.



SEPTEMBER, 1894.

**Mean amount of Cloud (an overcast sky being indicated by 10·0) 5·8**

**In the month of September, the highest reading of the Barometer during 47 years, was on the 15th, in 1851, and was ...30.274**

**The lowest**                    „                    **2nd, 1883**                    „                    **...28·323**

**The highest Temperature**                      6th, 1868                      „                      ...                      85·0

**The lowest**                   ,,                   **25th, 1885, and 30th, 1888..**   **29·8**

**The highest adopted mean temperature of the month, 1865 .. 59.1**

**The lowest**                      „                      „                      1863 .. 50·9

A remarkably fine and dry month ; but with a mean temperature below the average, owing to the Northerly winds all through the month. The mean reading of the barometer was  $\frac{1}{4}$  inch above the average, and was nearly equal to the highest reading of August. The rainfall was only one-fifth of the average. Ground frost on 4 days. Hail on one day.

## OCTOBER, 1894.

Results of Observations taken during the Month.		Mean for the last 47 years.
Mean Reading of the Barometer .....	29·485	29·423
Highest                   ,,                   on the 1st .....	30·117	30·015
Lowest                   ,,                   on the 24th.....	28·346	28·639
Range of Barometer Readings .....	1·771	1·376
Highest Reading of a Max. Therm. on the 11th	63·0	64·2
Lowest Reading of a Min. Therm. on the 21st	25·5	29·0
Range of Thermometer Readings .....	37·5	35·2
Mean of all the Highest Readings .....	55·2	54·6
Mean of all the Lowest Readings .....	41·0	41·6
Mean Daily Range ..	14·2	13·0
Deduced Monthly Mean (from Mean of Max. and Min.) .....	47·1	47·2
Mean Temperature from Dry Bulb.....	47·2	47·7
Adopted Mean Temperature .....	47·2	47·4
Mean Temperature of Evaporation.....	46·0	45·2
Mean Temperature of Dew Point .....	44·7	42·9
Mean elastic force of Vapour .....	0·295 in	0·276 in
Mean weight of Vapour in a cub. ft. of air .....	3·4 gr	3·2 gr
Mean additional weight required for saturation...	0·4 gr	0·6 gr
Mean degree of Humidity (saturation 1·00)...	0·92	0·84
Mean weight of a cubic foot of air .....	588·7 gr	587·4 gr
Fall of Rain .....	4·217 in	5·067 in
Number of days on which Rain fell .....	15	21·7

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	7	11	1	1	2	4	3	2
Mean Velocity in miles per hour	7·0	6·1	10·6	8·7	10·8	10·7	6·8	2·0
Total No. of miles for each Direction	1173	1599	255	209	887	1028	492	94

The total number of miles registered during the month was 5737.  
The max. Velocity of the wind was 42 miles per hour. Direction S.W., on the 24th at 10 p.m.

## OCTOBER, 1894.

Mean amount of Cloudan (overcast sky being indicated by 10·0) 7·9

In the month of October, the highest reading of the Barometer during 47 years, was on the 5th, in 1884, and was .... 30·306

The lowest ,, 19th, 1862 ,, .... 28·189

The highest Temperature 9th, 1869 ,, .... 72·8

The lowest ,, 24th, 1892 ,, .... 22·8

The highest adopted mean temperature of the month, 1861 & 76 51·6

The lowest ,, ,, 1880.... 43·1

The high barometric pressure of last month was maintained till the 17th of October. when a decided fall commenced ; but the northerly winds prevailed up to the 23rd, when the mercury went down rapidly before a moderate gale of wind on the 24th, and heavy rain fell on the 23rd and three following days, to the amount of 2·8 inches.

Ground frost on 5 days. Hail on one day.

# NOVEMBER, 1894.

Results of Observations taken during the Month.		Mean for the last 47 years.
Mean Reading of the Barometer .....	29·467	29·320
Highest                   ,,                   on the 30th ....	30·184	30·053
Lowest                   ,,                   on the 14th ....	28·502	28·563
Range of Barometer Readings .....	1·632	1·490
Highest Reading of a Max. Therm. on the 2nd	62·0	55·7
Lowest Reading of a Min. Therm. on the 30th	29·0	25·4
Range of Thermometer Readings .....	33·0	30·3
Mean of all the Highest Readings .....	52·1	47·1
Mean of all the Lowest Readings .....	40·5	36·3
Mean Daily Range .....	11·6	10·8
Deduced Monthly Mean (from Mean of Max. and Min.) .....	45·9	41·3
Mean Temperature from Dry Bulb.....	45·1	41·6
Adopted Mean Temperature.....	45·5	41·4
Mean Temperature of Evaporation.....	44·2	39·2
Mean Temperature of Dew Point .....	42·6	37·9
Mean elastic force of Vapour.....	0·274in	0·229 in
Mean weight of Vapour in a cub. ft. of air....	3·1gr	2·6 gr
Mean additional weight required for saturation	0·5gr	0·4 gr
Mean degree of Humidity (saturation 1·00) ..	0·90	0·87
Mean weight of a cubic foot of air .....	540·7gr	544·9 gr
Fall of Rain .....	3·546in	4·281 in
Number of days on which Rain fell .....	20	19·6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	0	4	0	11	11	4	0
Mean Velocity in miles per hour	0	0	9·4	0	13·9	7·5	14·1	0
Total No. of miles for each Direction	0	0	906	0	3676	2087	1352	0

The total number of miles registered during the month was 8021.  
The max. Velocity of the wind was 42 miles per hour. Direction S. by E., on the 14th, at 2 a.m.

## NOVEMBER, 1894.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·3

In the month of November, the highest reading of the Barometer during 47 years was on the 12th, in 1857, and was ..30·850

The lowest	„	11th, 1891	„	...27·938
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The highest Temperature	„	2nd, 1894	„	... 62·0
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The lowest	„	17th, 1861	„	... 19·1
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The highest adopted mean temperature of the month, 1881	47·0
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The lowest	„	„	1851	86·7
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A warm November with a mean temperature 4 ·1 above the average. The mean temperature of the first three days was above the mean temperature of last August. The barometer remained low until the 17th ; it reached its lowest dip on the 14th, with an inch of rain on the 13th, and then started on a steady rise from 28·57 on the 14th to 29·97 on the 21st, and remained high through the rest of the month.

# DECEMBER, 1894.

Results of Observations taken during the Month.		Mean for the last 47 years.
Mean Reading of the Barometer .....	29·524	29·461
Highest                    ,,                   on the 27th ..	30·246	30·076
Lowest                    ,,                   on the 22nd ..	28·482	28·595
Range of Barometer Readings .....	1·764	1·481
Highest Reading of a Max. Therm. on the 13th	53·4	53·0
Lowest Reading of a Min. Therm. on the 31st	25·0	20·1
Range of Thermometer Readings.....	28·4	32·9
Mean of all the Highest Readings .....	46·2	43·0
Mean of all the Lowest Readings .....	35·1	32·8
Mean Daily Range .....	11·1	10·2
Deducted Monthly Mean (from Mean of Max. and Min.) .....	40·7	37·9
Mean Temperature from Dry Bulb .....	40·5	38·6
Adopted Mean Temperature .....	40·6	38·3
Mean Temperature of Evaporation .....	39·0	36·7
Mean Temperature of Dew Point.....	37·0	34·9
Mean elastic force of Vapour.....	0·219in	0·205in
Mean weight of Vapour in a cub. ft. of air.....	2·5gr	2·4gr
Mean additional weight required for saturation	0·4gr	0·4gr
Mean degree of Humidity (saturation 1·00)....	0·87	0·87
Mean weight of a cubic foot of air.....	547·1gr	548·5gr
Fall of Rain .....	5·114in	5·257in
Number of days on which Rain fell .....	19	18·9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	4	0	4	1	2	14	4
Mean Velocity in miles per hour	6·4	3·6	0	14·4	6·5	8·4	12·4	13·7
Total No. of miles for each Direction	307	359	0	1381	156	403	4156	1315

The total number of miles registered during the month was 8·077.  
The max. Velocity of the wind was 72 miles per hour. Direction  
W. by S., on the 22nd, at 9-10 a.m.

DECEMBER, 1894.

**Mean amount of Cloud (an overcast sky being indicated by 10·0) 6·9**

In the month of December, the highest reading of the Bar-

ometer during 47 years, was on the 22nd, in 1849, and was 80.378

**The lowest                      „                      8th, 1886                      „ . . . . 27·350**

The highest Temperature	9th, 1876	„ ....	58.1
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The lowest                 ,,                 24th, 1860                 ,, ....                 6·7

**The highest dopted mean temperature of the month, 1857 . . . . 44.6**

The lowest „ . . . 1878 „ . . . 30·3

The barometer began a rather rapid fall on the 3rd, and then remained in an unsteady state, oscillating moderately about the mean height until the 16th, when the changes became greater :— 29·8 inches on the 16th, 28·9 on the 18th, 29·8 on the 20th, and 28·5 on the 22nd. With the last depression came the heavy gale of wind, the severest recorded by the Robinson anemograph, since it was mounted in 1867. A more rapid fall of the Mercury, set in at 4 p.m. on the 21st, to the lowest reading 28·50 at 7 a.m. on the 22nd, two hours before the gale was at its height, at 72 miles an hour. It was already blowing strongly at midnight, and freshened to a moderate gale (42 miles per hour) at 1 a.m., steadily increasing to a strong gale (58 miles) at 6 a.m., which it maintained till 4 p.m., rising to nearly hurricane speed at 9 a.m., and keeping up 60 miles and over between 8 a.m. and 2 p.m., with a rapidly rising barometer.

The barometer stood at 30 inches on the 25th, and continued to rise to 30½ on the 28th, when another fall set in with another westerly gale, having two maxima of velocity at 50 miles an hour, one at 9 p.m.; and the other at the following 7 a.m.

# DATES OF OCCASIONAL PHENOMENA.

1894.	Frost.	Hoar Frost.	Snow.	Hail.
January	1-9, 22-24, 26, 28-31		2-5, 7, 8, 26, 28-30	22, 28, 30
February	1, 5, 6, 12-15, 17-25, 27, 28	22	1, 14, 17	1, 12, 24, 27
March	1, 3-5, 7-11, 13, 15, 18, 22-27, 29-30	25	13	4, 11, 13, 14, 16
April	1, 15, 18, 20-24, 26, 27, 29, 30	20		25
May	1, 5, 8, 10, 18, 17, 20-23, 25, 26, 31	21	20	4, 26
June	7			
July				
August	21			4
September	27-30	10, 11, 18		29
October	2, 4, 18, 21-23	4		13, 14
November	12, 13, 15, 16, 21, 28-30	2	29	15, 18, 28, 29
December	1-9, 16, 20, 21, 26-31			



# DATES OF OCCASIONAL PHENOMENA.

(Continued.)

1894.	Heavy Rain	Fog	Thunder.	Lightning.	Lunar Halo.	Solar Halo.
January	30		17			
February	10	8, 22	12		17	
March	1, 5, 12	7, 22, 23, 29,	2, 3, 4, 9, 25, 28	7, 8, 17, 24, 25	15	
April	2, 8, 13		1, 26, 27, 30			
May	2		17			
June	16, 25		2, 6, 7, 9, 13, 25, 26	25		18
July	1, 2, 8, 12, 14, 19, 25		13			
August	23, 24, 25, 26	10, 14	5, 13	5		
September	7, 10, 13,	28, 31	29	29		
October	15, 17, 18, 21		7, 10, 11	11	8	
November				18		
December						

Aurora Borealis, February 23, 28, at 9-30 p.m.

" " March 30, 8 p.m. to 2 a.m.

" " July 20.

Rainbows, October 29 and 14

" November 13.

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1994.	January	February	March	April	May	June	July	August	Sept.	October	Nov.	Dec.
1				.40	.72	.40	.46		.45	.88	.41	.48
2	.52	.55		.40			.74		.87	.88	.67	.48
3	.45			.45					.40			
4				.45					.85			
5					.50	.79	.89	.72	.85			
6				.72		.41						
7	.47	.50		.41						.40		
8									.49	.41		
9									.50	.44		
10			.66	.88			.68		.50			
11			.42	.48	.71	.67	.46		.89	.86	.51	
12	.50	.58					.45	.44	.50	.87		
13		.44	.42	.89		.85		.68	.38			.44
14	.44		.39	.54	.48	.88						
15	.51		.54									
16												
17												
18												
19		.40		.45		.76				.50		
20	.49			.88		.45	.68		.65			
21	.47				.40			.47		.40		
22	.47		.48		.40							
23			.51						.89			
24		.66	.52		.52							
25					.69				.35			
26	.48	.67	.46		.85	.41		.69	.39		.41	
27			.43			.45			.40			
28			.41			.50			.46	.42		
29			.43		.86		.41		.47		.89	
30	.44		.44		.48		.44					.46
31			.69		88 & 69							

**TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.**

MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January -	2.7	2.3	1.8	1.7	0	2.8	0	0	0	0.4	2.8	4.3	3.6	0	0.3	0.3	1.0
February -	0.4	0	4.4	0	0.2	0	0	5.3	1.4	0	0	0.7	7.8	4.3	0	0	0
March -	0	4.6	3.0	4.9	0	3.2	0.2	3.1	0	1.7	6.8	1.0	4.4	3.3	3.6	6.4	3.4
April -	3.3	3.7	2.3	4.7	10.0	0.5	0.3	7.6	4.9	7.7	6.3	2.1	0	0	0	5.9	0.7
May -	10.3	0	3.4	11.1	6.7	11.3	9.7	0.6	1.3	3.7	0.7	10.7	6.3	0	0	0	5.6
June -	10.4	0	0	0	0	11.3	12.2	2.4	0	0	5.5	9.4	3.4	6.6	1.4	11.2	5.4
July -	14.7	0	12.2	3.7	3.5	10.2	6.0	6.2	2.3	4.3	9.1	10.7	7.3	11.3	0	0	0
August -	0	2.3	0.7	1.3	7.0	5.7	2.1	3.2	2.3	1.4	1.3	0	3.7	0	2.3	3.4	4.3
September -	5.4	0	3.6	6.3	5.0	7.2	0	7.0	9.3	3.2	1.7	3.7	6.2	3.7	0.4	2.7	0
October -	4.3	6.3	2.1	2.4	0	0.4	0	2.9	2.0	0	3.7	0	0	3.4	6.7	0.3	0.4
November -	0	5.0	1.2	3.7	0.7	1.6	0	4.3	0	1.3	2.2	0	5.3	0	3.2	2.6	2.0
December -	1.7	0	1.7	1.4	0	0	0	2.4	0	0	0	0.3	0	0	1.2	3.3	0

## TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

(Continued.)

MONTH.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Per centage each month.
January -	0	0	0	0.8	0	6.3	0	0.8	2.4	0	2.8	1.8	2.5	4.3	44.7	17.8
February -	0	6.6	2.8	0	2.2	0	5.8	0	0	3.7	2.4	..	..	..	48.5	17.4
March -	2.3	2.8	6.2	0.3	3.9	9.0	9.6	8.7	10.2	9.5	7.6	8.7	9.4	0.4	153.2	41.7
April -	5.8	7.2	12.0	11.7	11.4	6.1	2.0	3.4	0.8	1.8	7.3	0	2.7	..	141.2	84.0
May -	9.7	7.3	9.8	10.7	11.8	6.3	12.5	9.2	7.2	8.7	4.6	7.6	8.1	8.7	205.6	42.7
June -	1.4	10.6	4.9	12.3	1.8	0	8.3	0	1.2	13.8	13.8	12.2	13.7	..	178.8	36.2
July -	6.7	8.7	10.2	3.9	5.6	1.3	1.5	2.7	8.4	7.7	2.4	10.7	5.5	7.3	194.6	39.2
August -	1.0	0	8.6	0.8	11.2	0	1.3	1.5	0	0	8.2	4.8	0	0.7	90.9	20.3
September -	0	1.0	0	4.6	1.9	0.1	8.8	1.8	7.0	9.6	4.7	8.2	3.6	..	188.2	36.7
October -	0.8	0	2.3	3.2	5.5	0	1.1	1.7	0	0	0.3	0	5.5	0.8	62.6	19.0
November -	0	1.2	0	0.2	0	0	0.9	0	0	0	0	1.1	5.2	..	41.7	15.9
December -	0	2.9	4.5	0	0	0	0	0	0	5.8	0	0.8	2.7	2.9	81.6	13.1

# MONTHLY TABLES FOR EACH HOUR OF RECORDED SUNSHINE.

Local apparent time.	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9
January -	0	0	0	0	0	8.7	8.9	10.2	10.6	6.6	8.5	1.2	0	0	0	0	0
February -	0	0	0	0.2	0	5.0	5.3	7.8	7.8	8.7	6.5	3.1	1.5	0	0	0	0
March -	0	0	0.6	6.6	12.6	15.8	18.0	18.9	18.3	18.2	17.4	16.2	9.4	1.2	0	0	0
April -	0	0	3.3	9.2	12.5	13.6	16.8	16.9	14.1	12.0	12.2	13.6	11.2	5.8	0.5	0	0
May -	1.0	8.8	13.6	16.8	17.5	17.5	16.1	17.4	14.9	13.7	13.5	14.2	13.5	11.1	10.6	3.4	0
June -	0.8	7.7	11.8	13.8	11.7	13.5	11.8	12.2	13.4	11.5	13.4	15.0	14.2	13.4	12.2	2.9	0
July -	1.0	4.6	6.8	14.0	15.2	16.5	14.4	15.5	13.5	14.5	17.3	16.8	15.1	13.2	9.4	2.8	0
August -	0	0.8	2.2	5.5	5.2	7.6	7.7	9.6	9.7	10.6	8.7	7.6	7.4	5.9	2.4	0	0
September -	0	0	2.6	12.4	18.8	18.3	15.6	15.4	12.7	10.9	10.5	7.8	9.8	4.2	0.2	0	0
October -	0	0	0	1.9	3.2	7.2	10.2	9.8	8.1	9.4	7.5	4.5	1.3	0	0	0	0
November -	0	0	0	0	1.2	4.1	4.6	7.4	9.8	7.4	6.5	0.7	0	0	0	0	0
December -	0	0	0	0	0.8	2.3	5.6	6.5	6.6	5.7	4.1	0	0	0	0	0	0
Total -	2.8	21.9	42.4	79.9	100.8	125.1	135.7	147.1	144.5	129.2	121.1	100.2	82.9	54.3	35.8	9.1	0



## OBSERVATIONS OF UPPER CLOUDS (CIRRUS)

Date. 1894.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	V'locity (0-6)	Direction.	Force (0-12)	
January 1	9am	NW	3	NNE	2	NE
" 10	Noon	S	2	SE b E	4	SW
" 11	11-0am	S	2	S	7	S
" 15	10-15am	SW	2	SW b S	1	
" 25	11-20am	S	1	SW b W	3	W
" 28	9-10am	E	1	W b S	7	W
" 30	Noon	E	2	SW	6	SW
" 31	9-15a.m	SE	3	W b S	0	SW
February 5	4-15pm	W	1	WSW	0	SW
" 19	7-40am	E b S	2	SE b E	2	SW
" 19	10-15am	E b N	2	SSE	3	SW
" 20	8-35am	N	2	S b W	1	SW
" 20	3-5pm	NE b E	1	E b S	0	SW
March 8	4-0pm	E b N	3	WSW	3	E b N
" 10	8-15am	E	3	W b S	4	WSW
" 11	9am	E b N	2	WSW	6	SW b W
" 13	4pm	NE	3	WSW	4	SW b W
" 14	Noon	E b S	2	W b S	5	W
" 16	3-15pm	WNW	1	NW	2	NW
April 5	7-30am	WSW	2	Lost		
" 8	9-30am	N	2	Lost		S b E
" 9	5-30pm	WNW	2	S	3	S
" 10	8-15am	NW b N	1	SE	0	
" 10	Noon	NNW	2	S	3	S
" 11	5-40pm	SE	2	E b N	3	S b W
" 17	3pm	NNW	2	WSW	1	S
" 23	9am	NW	3	E b N	1	E
" 24	5-30pm	S	3	S	2	S b W
" 25	3-30pm	W	2	W		SW
" 26	5 15pm	E	3	S		W
May 4	5-30pm	SE	3	W	3	NW
" 17	9-30am	W	2	NE	1	NE
" 18	10am	N	2	NE	1	
" 25	9am	SW	2	W	1	
" 26	7-30am	S	3	NW	2	N
" 30	11-30am	W	2	SW	1	S
June 11	9am	SE b E	3	NW b W	3	W
" 12	2pm	NW	2	W	1	W
" 14	7-30am	S	2	W	1	NW b W



OBSERVATIONS OF UPPER CLOUDS (*Continued*)

Date 1894.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	V'locity (0—6).	Direction.	Force. (0—12).	
June 16	7-30am	NW b W	2	NW b W	0	SW
„ 21	Noon	WNW	2	SW b W	0	SW
„ 27	Noon	NW b N	2	NE	1	N
July 5	Noon	S	2	SW	1	SW b S
„ 10	2pm	SE b S	2	SW	1	SW b N
„ 11	4pm	SE	2	SW	5	SW
„ 18	5-40pm	NW	3	W	2	NW b W
„ 19	9-15am	NW	2	NW b W	2	W
„ 22	9-45am	SW b W	2	W	1	SW b W
„ 30	9-30am	NW	1	NE b E	0	N
August 22	5-30pm	SE b S	1	WSW	0	
Sept. 6	4pm	NE b E	3	N b E	0	NW
„ 12	Noon	SW b W	1	NE	1	NE
„ 25	7-30am	W	3	ENE	2	NE
„ 26	8-15am	SW b W	2	NNE	1	NE
„ 26	10-30am	SW	2	NNE	1	NE b N
October 8	8-45am	NW	2	NE b N	0	
„ 20	7-30am	SW	3	NE b N	1	
„ 25	1-40pm	NE	2	WSW	4	SW
Nov. 1	9-20am	NE b E	2	S	5	SW
„ 6	Noon	E b N	3	WSW	3	SW b N
„ 13	3-45pm	N	2	SW	2	SW
„ 14	8am	S	3	SW	1	
„ 16	Noon	SE b S	2	SSW	2	
„ 17	12-30am	NE b N	3	S	5	S b E
„ 21	8-45am	N	2	W b S	1	W
„ 24	12-30am	SW	2	ENE	2	E
Dec. 5	2-40pm	W	2	NE b E	0	SW b W
„ 12	8-50am	NW	2	W	2	SW
„ 16	9-30am	NW	2	N	2	N
„ 19	9-20am	NW	2	NW b W	6	SW
„ 23	10 40am	NW	1	W b S	3	WNW

# MONTHLY MAGNETICAL OBSERVATIONS

## TAKEN AT THE

### COLLEGE OBSERVATORY, STONYHURST, 1894.

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THE Horizontal, Vertical, and Total Forces are calculated to English measure ; one foot, one second of mean solar time, and one grain being assumed as the units of space, of time, and of mass.

The Vertical and Total Forces are obtained from the absolute measures of the Horizontal Force, and of the Dip.

In the observations of Deflection and Vibration, taken each month for absolute measure of Horizontal Force, the same magnet has always been employed.

The moment of inertia of the magnet with its stirrup, for different degrees of temperature, and the co-efficients in the corrections required for the effects of temperature and of terrestrial magnetic induction on the magnetic moment of the magnet, were determined at the Kew Observatory by the late Mr. Welsh.

The moment of inertia of the magnet with its stirrup, using the grain and foot as the units of mass and of linear measure is 5.27303. Its rate of increase for increase of temperature is 0.00073 for every 10° of Fahr.

The weight of the magnet with its stirrup is approximately 825 grains, and the length of the magnet is nearly 3.94 inches. The moment of inertia was determined, independently of the weight and dimensions, by the method of vibration, with and without a known increase of the moment of inertia.

The temperature corrections have always been obtained from the formula  $q(t^\circ - 35^\circ + q'(t^\circ - 35^\circ)^2$ , where  $t^\circ$  is the observed temperature and 35° Fahr. the adopted standard temperature. The values of the co-efficient  $q$  and  $q'$  are respectively 0.0001128 and 0.000000436

The induction co-efficient  $\mu$  is 0.000244.

The correction for error of graduation of the Deflection bar at 1.0 foot is  $+ 0.00004$  ft, at 1.3  $+ 0.000064$  ft.

The observed times of vibration are entered in the Table without corrections.

The time of one vibration has been obtained each month from the mean of twelve determinations of the time of 200 vibrations.

The angles of deflection are each the mean of two sets or readings.

In deducing from these observations the ratio and product of the magnetic moment  $m$  of the magnet, and the earth's horizontal magnetic intensity  $X$ , the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread; but no correction has been required for the rate of the chronometer, or for the arc of vibration, the former having been always under 1.5s and the latter never over 50'.

The average deflection of the magnet caused by a twist of the torsion circle through  $90^\circ$  has been about  $11'.6$  of arc.

In the calculations of the ratio  $\frac{m}{X}$ , the third and subsequent

terms of the series  $1 + \frac{P}{r^2} + \frac{Q}{r^4} + \&c.$ , have always been omitted.

The value of the constant  $P$  was found to be  $-0.00217$ .

The Declination observations have been taken once a week

## OBSERVATIONS OF DECLINATION AND DIP.

MONTH	G.M.T.	WEST DECLINATION		DIP.	G.M.T.
	CIVIL DAY	Observations	Monthly Mean.		CIVIL DAY.
	D. H. M.	° ' "	° ' "	° ' "	D. H. M.
Jan.	2 16 10	19 5 39	18 52 2	69 6 14	25 12 43
	9 16 5	18 49 34			
	15 16 20	18 54 84			
	22 16 5	18 52 29			
	29 16 5	18 37 54			
Feb.	5 16 5	18 44 34	18 37 45	69 7 21	21 10 50
	13 16 10	18 47 49			
	19 16 15	18 37 44			
	26 16 0	18 20 54			
March	5 16 0	18 45 54	18 50 24	69 4 44	15 16 18
	12 16 0	18 49 24			
	19 16 0	18 52 24			
	26 16 0	18 53 54			
April	3 16 0	18 52 59	18 44 14	69 2 14	18 16 30
	9 16 0	18 49 44			
	16 16 0	18 41 34			
	23 16 10	18 50 59			
May	30 16 10	18 25 54	18 44 17	69 6 3	19 16 45
	7 16 5	18 35 54			
	14 16 10	18 46 39			
	21 16 10	18 45 24			
June	28 16 15	18 49 10	18 48 33	69 4 27	14 16 30
	4 15 45	18 51 19			
	11 16 10	18 45 9			
	18 15 45	18 52 49			
	25 16 5	18 44 54			

# OBSERVATIONS OF DECLINATION AND DIP.

(Continued.)

MONTH	G.M.T	WEST DECLINATION		DIP.	G.M.T.	
	CIVIL DAY	Observations	Monthly Mean.		CIVIL DAY.	
	D. H. M.	° ' "	° ' "	° ' "	D. H. M.	
July	2 16 15	18 51 14	18 46 20	68 56 31	23 11 53	
	9 15 50	18 46 19				
	17 16 10	18 47 44				
	23 12 40	18 40 4				
August	6 16 15	18 38 44	18 39 39	68 47 33	17 16 18	
	21 16 15	18 45 19				
	28 16 25	18 34 54				
Sept.	3 16 10	18 42 14	18 43 29	69 5 34	21 11 15	
	11 16 5	18 41 59				
	24 16 10	18 46 14				
Oct.	1 15 55	18 50 29	18 44 55	69 6 23	17 10 48	
	8 16 15	18 56 5				
	16 16 0	18 36 49				
	22 16 5	18 40 4				
	29 16 15	18 41 9				
Nov.	5 16 5	18 45 34	18 42 2	68 58 6	14 12 7	
	12 16 0	18 44 14				
	19 16 0	18 42 14				
	26 16 0	18 36 4				
Dec.	3 16 10	18 34 24	18 35 57	69 0 36	20 11 23	
	18 16 0	18 31 49				
	31 16 40	18 41 39				
Yearly Mean.			18 44 8	69 2 9		

**OBSERVATIONS OF VIBRATIONS AND DEFLECTIONS  
FOR ABSOLUTE MEASURE OF MAGNETIC FORCE.**

Month.	G. M. T. (Civil Day).	Temp.	Time of one vibration.	G. M T.	Temp.	Observed Deflection at 1.0 ft. at 1.3 ft.
	D. H. M.	°		D. H. M.	°	° ' "
Jan.	15 11 20	46.5	5.9693	15 { 12 35 12 38	45.8 45.8	12 7 6 5 29 15
Feb.	20 11 11	36.9	5.9711	20 { 12 28 12 32	37.1 36.8	12 5 54 5 28 25
Mar.	15 10 34	48.2	5.9723	15 { 11 50 11 50	50.1 49.9	12 6 22 5 28 50
Apr.	17 9 57	50.4	5.9778	17 { 11 14 11 16	53.4 53.6	12 3 37 5 27 38
May	19 10 10	48.1	5.9842	19 { 11 42 11 46	49.0 49.0	12 5 46 5 28 38
June	14 10 19	59.5	5.9783	14 { 11 28 11 32	60.5 60.7	12 4 37 5 28 23
July	23 9 34	57.3	5.9856	23 { 10 20 10 40	59.3 60.2	12 5 45 5 28 40
Aug.	17 10 12	56.3	5.9880	17 { 11 38 11 30	57.3 56.9	12 3 15 5 28 10
Sept.	21 8 0	52.0	5.9860	21 { 9 45 9 48	55.5 56.0	12 5 4 5 28 7
Oct.	16 12 5	52.2	5.9871	16 { 10 38 10 19	46.8 47.8	12 6 18 5 28 47
Nov.	13 8 53	46.4	5.9743	13 { 11 8 11 10	49.2 50.0	12 3 34 5 27 50
Dec.	19 10 32	45.8	5.9837	19 { 11 35 11 45	53.1 53.9	12 2 9 5 27 51

## MAGNETIC INTENSITY.

BRITISH UNITS.				C. G. S. UNITS.		
	X or horizontal force.	Y or vertical force.	Total Force.	X or Horizontal Force.	Y or Vertical Force.	Total Force.
Jan. ..	3·7178	9·7381	10·4237	0·1714	0·4490	0·4806
Feb. ..	3·7206	9·7547	10·4400	0·1716	0·4498	0·4814
Mar. ..	3·7144	9·7163	10·4021	0·1713	0·4480	0·4796
April ..	3·7174	9·7031	10·3909	0·1714	0·4474	0·4791
May ..	3·7117	9·7204	10·4050	0·1711	0·4482	0·4798
June ..	3·7183	9·7239	10·4105	0·1714	0·4484	0·4800
July ..	3·7111	9·6386	10·3284	0·1711	0·4444	0·4762
Aug. ..	3·7136	9·5709	10·2660	0·1712	0·4413	0·4733
Sept. ...	3·7100	9·7119	10·3964	0·1711	0·4478	0·4794
Oct. ..	3·7125	9·7255	10·4100	0·1712	0·4484	0·4800
Nov. ..	3·7243	9·6862	10·3775	0·1717	0·4466	0·4785
Dec. ..	3·7194	9·6944	10·3835	0·1715	0·4470	0·4788
Means	3·7159	9·6987	10·3862	0·1713	0·4472	0·4789

**OBSERVATIONS OF VIBRATIONS AND DEFLECTIONS  
FOR ABSOLUTE MEASURE OF MAGNETIC FORCE.**

Month.	G. M. T. (Civil Day).	Temp.	Time of one vibration.	G. M. T.	Temp.	Observed Deflection at 1.0 ft. at 1.3 ft.
	D. H. M.	°		D. H. M.	°	° ' "
Jan.	15 11 20	46.5	5.9693	15 { 12 35 12 38	45.8 45.8	12 7 6 5 29 15
Feb.	20 11 11	36.9	5.9711	20 { 12 28 12 32	37.1 36.8	12 5 54 5 28 25
Mar.	15 10 34	48.2	5.9723	15 { 11 50 11 50	50.1 49.9	12 6 22 5 28 50
Apr.	17 9 57	50.4	5.9778	17 { 11 14 11 16	53.4 53.6	12 3 37 5 27 38
May	19 10 10	48.1	5.9842	19 { 11 42 11 46	49.0 49.0	12 5 46 5 28 38
June	14 10 19	59.5	5.9783	14 { 11 28 11 32	60.5 60.7	12 4 37 5 28 23
July	23 9 34	57.3	5.9856	23 { 10 20 10 40	59.3 60.2	12 5 45 5 28 40
Aug.	17 10 12	56.3	5.9880	17 { 11 38 11 30	57.3 56.9	12 3 15 5 28 10
Sept.	21 8 0	52.0	5.9860	21 { 9 45 9 48	55.5 56.0	12 5 4 5 28 7
Oct.	16 12 5	52.2	5.9871	16 { 10 38 10 19	46.8 47.8	12 6 18 5 28 47
Nov.	13 8 53	46.4	5.9743	13 { 11 8 11 10	49.2 50.0	12 3 34 5 27 50
Dec.	19 10 32	45.8	5.9837	19 { 11 35 11 45	53.1 53.9	12 2 9 5 27 51



## MAGNETIC INTENSITY.

BRITISH UNITS.				C. G. S. UNITS.		
	X or horizontal force.	Y or vertical force.	Total Force.	X or Horizontal Force.	Y or Vertical Force.	Total Force.
Jan. ..	3·7178	9·7381	10·4237	0·1714	0·4490	0·4806
Feb. ..	3·7206	9·7547	10·4400	0·1716	0·4498	0·4814
Mar. ..	3·7144	9·7163	10·4021	0·1713	0·4480	0·4796
April ..	3·7174	9·7031	10·3909	0·1714	0·4474	0·4791
May ..	3·7117	9·7204	10·4050	0·1711	0·4482	0·4798
June ..	3·7183	9·7239	10·4105	0·1714	0·4484	0·4800
July ..	3·7111	9·6386	10·3284	0·1711	0·4444	0·4762
Aug. ..	3·7136	9·5709	10·2660	0·1712	0·4413	0·4733
Sept. ..	3·7100	9·7119	10·3964	0·1711	0·4478	0·4794
Oct. ..	3·7125	9·7255	10·4100	0·1712	0·4484	0·4800
Nov. ..	3·7243	9·6862	10·3775	0·1717	0·4466	0·4785
Dec. ..	3·7194	9·6944	10·3835	0·1715	0·4470	0·4788
Means	3·7159	9·6987	10·3862	0·1713	0·4472	0·4789

marked vg. The days are reckoned astronomically, from noon to noon. The asterisk signifies that the record was partly or wholly lost, according as it stands with or without an initial letter.

MONTH.	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct	Nov.	Dec	
1	c	s	m	s	m	m	m	s	s	s	s	s	
2	s	s	s	s	m	s	s	c	s	s	s	s	
3	s	s	c	s	s	s	s	s	s	c	s	c	
4	s	s	s	s	m	s	s	m	s	m	s	c	
5	s	s	c	s	s	s	s	s	s	c	c	m	
6	s	s	s	m	s	s	s	s	s	s	s	m	
7	s	s	c	m	s	s	s	s	s	s	s	s	
8	c	c	s	s	s	s	s	s	s	s	s	s	
9	s	s	s	s	s	s	s	s	m	c	s	s	
10	s	c	s	c	s	m	s	s	m	c	s	c	
11	m	c	c	c	s	m	c	s	m	c	s	s	
12	s	s	c	m	s	s	s	s	s	s	c	s	
13	s	c	c	m	m	m	s	m	s	c	vg	m	
14	c	c	s	s	m	m	s	m	vg	s	m	s	
15	c	s	s	c	m	m	s	m	s	s	m	m	
16	c	s	s	c	s	m	m	c	s	m	m	s	
17	c	s	s	g	s	m	m	c	s	s	m	s	
18	c	s	s	m	s	m	m	c	m	s	g	s	
19	c	s	s	m	s	m	m	vg	g	s*	m	s	
20	c	m	c	m	s	m	vg	m	g	s	s	s	
21	s	vg	m	s	m	m	s	s	m	s	c	s	
22	s	vg	m	c	s	m	s	s	m	s	c	s	
23	s	vg*	m	s	s	s	s	s	s	c	m	s	
24	s	m	s	s	s	s	m	s	s	s	m	c	
25	s	vg	m	m	s	s	m	m	s	m	m	s	
26	s	m	s	m	s	s	m	m	s	s	s	c	
27	c	s	c	s	m	s	s	s	s	m	s	s	
28	s	g	c	s	s	s	m	s	c	c	s	s	
29	s		c	m	m	s	m	s	s	s	s	s	
30	s		vg	m	m	m	s	s	s	m	s	s	
31	s		m		m		s	s		m		c	
Totals	c s m g vg	10 19 1 1 0	5 15 3 1 4	m 14 6 0 1	5 13 11 1 0	0 20 11 0 0	0 15 m 2 0	1 18 m 1 1	4 19 7 0 1	1 20 6 2 1	6 18 7 0 0	4 16 8 1 1	6 21 4 0 0

## PRESENTS RECEIVED.

Greenwich Observations, 1891 - -	Royal Observatory
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Collection of Results for Declination, Dip, and Intensity, from obser- vations made by the U.S. Coast Survey between 1833 and July, 1882, by Charles Schott - -	"
Directions for measurement of Teres- trial Magnetism, by the same - -	"
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Loi de répartition des raies et des bandes communes à plusieurs spectres de bandes. Analogie avec la loi de succession des sons d'un corps solide, par le même -	"
Spectre de bandes ultra-violet des composés hydrogénés et oxygénés du carbone; par le même	"
Propriété fondamentale commune aux deux classes de spectres. Caractères distinctifs de chacune	"

des classes. Variations périodiques à trois paramètres, par le même - - - -	L'Auteur
Contribution à la recherche de la couronne Solaire en dehors des éclipses totales; par le même -	„
L'Expression du nombre des classes déduite de la transformation des fonctions elliptiques, par le P. De Segurier, S.J. - - - -	„
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S. Bonifazio e S. Alessio sull'Aventino, dal medesimo - - - -	"
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S. Sirio primo vescovo di Paria, dal medesimo - - - -	"
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APPENDIX

RESULTS

OF

METEOROLOGICAL OBSERVATIONS

TAKEN AT

ST. IGNATIUS' COLLEGE, MALTA

BY THE

REV. J. DOBSON, S.J.

1894.

# ST. IGNATIUS' COLLEGE, MALTA.

Lat.  $35^{\circ} 55'$  N.      Long.  $14^{\circ} 29'$  E.      Barometer Readings  
reduced to  $32^{\circ}$  F. at sea level.

## METEOROLOGICAL REPORT.

JANUARY, 1894.

Results of Observations taken during the Month.		Average 10 yrs.
Mean Reading of the Barometer . . . . inches	30·076	30·056
Highest                    „            on the 16th            „	30·329	30·425
Lowest                    „            on the 3rd            „	29·672	29·578
Range of Barometer Readings . . . . .	0·657	0·847
Highest Reading of a Max. Therm. on the 25th	63·8	64·9
Lowest Reading of a Min. Therm. on the 18th	42·0	41·8
Range of Thermometer Readings . . . . .	21·8	23·1
Greatest Range in 24 hours on the 25th . . . . .	18·6	18·4
Mean of all the Highest Readings . . . . .	59·1	59·0
Mean of all the Lowest Readings . . . . .	47·4	48·6
Mean Daily Range . . . . .	11·7	10·4
Mean Temperature (deduced from Max. & Min.)	52·6	53·1
Mean Temperature (deduced from Dry Bulb)	52·4	52·9
Adopted Mean Temperature . . . . .	52·5	53·0
Mean Temperature of Evaporation . . . . .	48·6	48·7
Mean Temperature of Dew Point . . . . .	46·0	45·6
Mean elastic force of Vapour . . . . . inches	0·311	0·306
Mean weight of Vapour in a cub. ft. of air grains	3·5	3·5
Mean additional weight required for saturation „	0·7	0·9
Mean degree of Humidity . . . . .	82	80
Mean weight of a cubic foot of air . . . . grains	542·7	542·5
Fall of rain . . . . . inches	3·995	3·594
Number of Days on which rain fell . . . . .	19	13
Mean amount of Cloud (an overcast sky=10)	7·2	5·0
Total number of miles of Wind indicated . . . .	5747	8500
Mean Velocity of Wind per hour . . . . . miles	7·8	11·4

## FEBRUARY.

Results of Observations taken during the Month			Average 10 yrs.
Mean Reading of the Barometer.....inches	30.091		30.020
Highest                   ,,           on the 3rd   ,,	30.434		30.320
Lowest                   ,,           on the 20th   ,,	29.812		29.623
Range of Barometer Readings .....	0.622		0.697
Highest Reading of a Max. Therm. on the 28th	64.8		67.1
Lowest Reading of a Min. Therm. on the 16th	42.8		41.7
Range of Thermometer Readings .....	22.0		25.4
Greatest Range in 24 hours on the 28th ....	17.8		19.6
Mean of all the Highest Readings.....	58.7		60.1
Mean of all the Lowest Readings .....	49.9		48.9
Mean Daily Range.....	8.8		11.2
Mean Temperature(deduced from Max. & Min.)	53.3		53.5
Mean Temperature (deduced from Dry Bulb)	54.2		53.8
Adopted Mean Temperature .....	53.8		53.6
Mean Temperature of Evaporation .....	49.8		49.5
Mean Temperature of Dew Point .....	47.1		46.6
Mean elastic force of Vapour .....inches	0.324		0.319
Mean weight of Vapour in a cub. ft. of air grains	3.7		3.6
Mean additional weight required for saturation,,	0.8		0.8
Mean degree of Humidity .....	84		82
Mean weight of a cubic foot of air..grains	541.5		540.8
Fall of Rain .....	4.400		2.087
Number of days on which Rain fell .....	8		10
Mean amount of Cloud (an overcast sky=10)..	6.5		4.7
Total number of miles of Wind indicated ..	9813		7675
Mean Velocity of Wind per hour .....	14.6		11.8

## MARCH.

Results of Observations taken during the month.		Average 10 yrs.
Mean Reading of the Barometer..... inches	29.982	29.989
Highest                   ,,                   on the 29th   ,,	30.317	30.363
Lowest                   ,,                   on the 31st   ,,	29.601	29.496
Range of Barometer Readings .....	0.716	0.867
Highest Reading of a Max. Therm. on the 14th	68.3	74.7
Lowest Reading of a Min. Therm. on the 29th	41.7	42.9
Range of Thermometer Readings.....	26.6	31.8
Greatest Range in 24 hours on the 29th .....	20.1	23.1
Mean of all the Highest Readings .....	62.0	63.3
Mean of all the Lowest Readings .....	51.2	50.8
Mean Daily Range .....	10.8	12.5
Mean Temperature (deduced from Max. & Min.)	55.8	56.2
Mean Temperature (deduced from Dry Bulb)	54.0	55.6
Adopted Mean Temperature.....	54.9	55.9
Mean Temperature of Evaporation .....	50.0	51.9
Mean Temperature of Dew Point .....	46.1	48.7
Mean elastic force of Vapour .....inches	0.312	0.345
Mean weight of Vapour in a cub. ft. of air grains	3.5	3.9
Mean additional weight required for saturation ,,	1.2	1.1
Mean degree of Humidity .....	75	79
Mean weight of a cubic foot of air .....grains	538.5	537.0
Fall of Rain .....	1.490	0.896
Number of days on which Rain fell .....	11	7
Mean amount of Cloud (an overcast sky=10)	5.8	4.4
Total number of miles of Wind indicated.....	7322	8175
Mean Velocity of Wind per hour .....	9.8	10.9

## APRIL.

Results of Observations taken during the Month.	Average 10 yrs.
Mean Reading of the Barometer.....inches 29·975	29·925
Highest                   ,,                   on the 15th ,, 30·219	30·256
Lowest                   ,,                   on the 3rd ,, 29·577	29·499
Range of Barometer Readings ..... ,, 0·642	0·757
Highest Reading of a Max. Therm. on the 22nd 72·5	77·1
Lowest Reading of a Min. Therm. on the 7th 47·0	48·0
Range of Thermometer Readings ..... 25·5	29·1
Greatest Range in 24 hours on the 26th..... 19·6	22·1
Mean of all the Highest Readings..... 66·8	67·4
Mean of all the Lowest Readings ..... 53·9	54·3
Mean Daily Range ..... 12·9	13·1
Mean Temperature (deduced from Max. & Min ) 59·4	59·9
Mean Temperature (deduced from Dry Bulb) 59·3	59·6
Adopted Mean Temperature ..... 59·3	59·8
Mean Temperature of Evaporation ..... 56·4	55·6
Mean Temperature of Dew Point ..... 53·8	52·1
Mean elastic force of Vapour .....inches 0·415	0·389
Mean weight of Vapour in a cub. ft. of air grains 4·7	4·4
Mean additional weight required for saturation ,, 1·0	1·4
Mean degree of Humidity ..... 83	77
Mean weight of a cubic foot of air ....grains 532·1	531·0
Fall of Rain .....inches 1·513	0·768
Number of Days on which rain fell ..... 8	6
Mean amount of Cloud (an overcast sky=10) 5·6	4·3
Total number of miles of Wind indicated.... 7502	8473
Mean Velocity of Wind per hour .....miles 10·4	11·8

## SEPTEMBER.

Results of Observations taken during the Month.			Average 10 yrs.
Mean Reading of the Barometer ..inches	30·054		30·064
Highest                   ,,                   on the 12th   ,,	30·245		30·246
Lowest                   ,,                   on the 30th   ,,	29·837		29·849
Range of Barometer Readings.....	0·408		0·397
Highest Reading of a Max. Therm. on 5th & 14th	95·8		92·2
Lowest Reading of a Min. Therm. on the 23rd	65·0		62·9
Range of Thermometer Readings .....	30·8		29·3
Greatest Range in 24 hours on the 5th .....	29·0		23·0
Mean of all the Highest Readings.....	87·3		82·6
Mean of all the Lowest Readings .....	71·6		68·5
Mean Daily Range.....	15·7		14·1
Mean Temperature (deduced from Max & Min)	78·6		74·7
Mean Temperature (deduced from Dry Bulb)	76·6		74·5
Adopted Mean Temperature .....	77·6		74·6
Mean Temperature of Evaporation .....	71·8		68·9
Mean Temperature of Dew Point .....	68·4		64·8
Mean elastic force of Vapour .....inches	0·694		0·615
Mean weight of Vapour in a cub. ft. of air grains	7·0		6·7
Mean additional weight required for saturation ,,	2·8		2·6
Mean degree of Humidity .....	76		72
Mean weight of a cubic foot of air ..grains	514·2		517·3
Fall of Rain .....	0·234		1·375
Number of Days on which rain fell .....	1		5
Mean amount of Cloud (an overcast sky=10)	2·1		2·4
Total number of miles of Wind indicated....	5901		5630
Mean Velocity of Wind per hour .....miles	8·2		7·8

## OCTOBER

Results of Observations taken during the Month.	Average 10 yrs.
Mean Reading of the Barometer....inches 30·114	30·045
Highest „ on the 23rd „ 30·191	30·274
Lowest „ on the 3rd „ 29·831	29·727
Range of Barometer Readings ..... „ 0·360	0 547
Highest Reading of a Max. Therm. on the 19th 90·1	87·4
Lowest Reading of a Min. Therm. on the 15th 59·4	55·7
Range of Thermometer Readings ..... 30 7	31·7
Greatest Range in 24 hours on the 4th ..... 20·1	19·6
Mean of all the Highest Readings ..... 81·1	76·1
Mean of all the Lowest Readings ..... 67·8	64·3
Mean Daily Range .. ..... 13 3	11·8
Mean Temperature (deduced from Max. & Min.) 73·6	69·8
Mean Temperature (deduced from Dry Bulb) 72 6	68·4
Adopted Mean Temperature ..... 73·1	68·9
Mean Temperature of Evaporation..... 68·5	64·2
Mean Temperature of Dew Point ..... 65·3	60·7
Mean elastic force of Vapour .....inches 0·624	0·536
Mean weight of Vapour in a cub. ft. of air grains 6·8	5·8
Mean additional weight required for saturation „ 1·9	1·7
Mean degree of Humidity ..... 74	77
Mean weight of a cubic foot of air grains .. 519·8	523·4
Fall of Rain .....inches 1·622	3·013
Number of days on which Rain fell ..... 4	8
Mean amount of Cloud (an overcast sky=10) 4·7	4·2
Total number of miles of wind indicated ..... 5555	6802
Mean Velocity of Wind per hour.....miles 7·5	9·2

## NOVEMBER.

Results of Observations taken during the Month.			Average 10 yrs
Mean Reading of the Barometer ....inches	30.066		30.076
Highest                   ,,                   on the 22nd   ,,	30.236		30.328
Lowest                   ,,                   on the 10th   ,,	29.585		29.727
Range of Barometer Readings .....	0.651		0.601
Highest Reading of a Max. Therm. on the 1st	78.6		76.1
Lowest Reading of a Min. Therm. on the 25th	52.5		49.0
Range of Thermometer Readings .....	26.1		27.1
Greatest Range in 24 hours on the 8th.....	19.1		18.5
Mean of all the Highest Readings .....	70.6		68.0
Mean of all the Lowest Readings .....	58.5		56.9
Mean Daily Range .....	12.1		11.1
Mean Temperature (deduced from Max. & Min.)	63.4		61.7
Mean Temperature (deduced from Dry Bulb)	62.3		61.2
Adopted Mean Temperature.....	62.8		61.5
Mean Temperature of Evaporation.....	58.1		56.9
Mean Temperature of Dew Point .....	51.3		53.8
Mean elastic force of Vapour .....inches	0.978		0.414
Mean weight of Vapour in a cub. ft. of air grains	4.8		4.7
Mean additional weight required for saturation,,	1.3		1.3
Mean degree of Humidity .....	80		79
Mean weight of a cubic foot of air.....grains	581.2		532.6
Fall of Rain .....	4.559		3.305
Number of days on which Rain fell .....	16		10
Mean amount of Cloud (an overcast sky=10)	6.6		4.8
Total number of miles of Wind indicated ....	5277		6809
Mean Velocity of Wind per hour.....miles	7.3		9.5



## AUGUST.

Results of Observations taken during the Month	Average 10 yrs.
Mean Reading of the Barometer .....inches 30·031	30·010
Highest                    "               on the 24th   ,,   30·217	30·156
Lowest                    "               on the 14th   ,,   29·906	29·863
Range of Barometer Readings .....   ,,   0·811	0·293
Highest Reading of a Max. Therm. on the 30th 95·2	97·0
Lowest Reading of a Min. Therm. on the 23rd 65·2	66·2
Range of Thermometer Readings..... 30·0	30·8
Greatest Range in 24 hours on the 30th..... 24·8	26·2
Mean of all the Highest Readings..... 86·4	87·8
Mean of all the Lowest Readings..... 70·1	71·1
Mean Daily Range ..... 16·3	16·2
Mean Temperature (deduced from Max. & Min.) 77·6	78·4
Mean Temperature (deduced from Dry Bulb) 77·2	78·4
Adopted Mean Temperature ..... 77·4	78·4
Mean Temperature of Evaporation.... 70·9	71·4
Mean Temperature of Dew Point..... 66·8	66·7
Mean elastic force of Vapour .....inches 0·646	0·658
Mean weight of Vapour in a cub. ft. of air grains 6·2	7·0
Mean additional weight required for saturation,, 3·1	3·8
Mean degree of Humidity ..... 69	67
Mean weight of a cubic foot of air.....grains 513·4	512·2
Fall of Rain ..... ..inches 0·000	0·000
Number of days on which Rain fell..... 0	0
Mean amount of Cloud (an overcast sky=10).. 0·6	1·0
Total number of miles of Wind indicated .... 5862	5442
Mean Velocity of Wind per hour .....miles 7·9	7·3

The Maximum monthly mean height of the Barometer was  
in November, 1889, and was .....inches 30.249  
The Minimum       "       "       in January, 1886, and was 29.844

The Maximum yearly mean height of the Barometer was in 1884, and was.....inches	30·057
The Minimum „ „ in 1890, and was .....	29·996
The greatest monthly range of the Barometer was in January, 1886, and was .....	1·201
The least „ „ in August, 1883, and was .....	0·188
The highest reading, of the Barometer, was on January 26th, 1887, and was .....	30·627
The lowest „ „ on 17th January, 1886, and was	29·155
Extreme range .....	1·472
The highest temperature was on July 20th, 1889, and was..	104·1
The lowest „ „ February 20th, 1851 .....	37·7
The highest mean temperature of a month, was in August, 1885, and was.....	83·2
The lowest „ „ February, 1891, and was..	49·5
The greatest monthly mean weight of vapour, } in a cubic foot of air .....grains }	August, 1885 7·9
The least „ „ January and February, 1891, and was..gr	8·0
The highest observed Dew point was on the 30th August, 1885, and was .....	78·7
The lowest „ „ 19th January 1891, and was	28·6
The greatest fall of rain in a month, was in December, 1889, and was .....	inches 8·952
The greatest number of days on which } rain fell in one month ....days }	January, 1889 .... 24
The greatest fall of rain in a year was in 1889 and was inches	26·044
The smallest „ „ „ 1888 „ „	13·745
The greatest number of rainy days in a year was in 1894 and was	90
The least „ „ „ „ 1882 „	40
The highest temperature registered in sunshine was on the 20th July, 1889, and was.....	158·8
The lowest temperature registered on ground was on the 25th January, 1891, and was .....	32·5
The highest observed sea temperature was on the 5th August, 1887, and was .....	85·0
The lowest „ „ 23rd January, 1891, and was	56·0
The smallest mean amount of cloud observed in one month was in August, 1890, and was .....	0·0
The greatest „ „ in January, 1894, and was	7·2

## Summary of Observations FOR 1894.

Results of observations taken during the Year		Mean of year 1883-1894
Mean Reading of the Barometer ....inches	30·027	30·025
Highest ,, on February 3rd ..	30·434	30·505
Lowest ,, on December 31st ..	29·490	29·354
Range of Barometer Readings .....	0·944	1·151
Highest Reading of a Max. Therm. on July 12th	96·3	99·3
Lowest Reading of a Min. Therm. on Mar. 29th	41·7	40·9
Range of Thermometer Readings .....	54·6	58·4
Greatest Range in 24 hours on the 5th Sept...	29·0	28·9
Mean of all the Highest Readings .....	72·7	72·4
Mean of all the Lowest Readings.....	59·4	59·2
Mean Daily Range .....	13·3	13·2
Mean Temperature (deduced from Max. & Min)	65·2	64·9
Mean Temperature (deduced from dry bulb)..	64·7	64·4
Adopted Mean Temperature .....	65·0	64·7
Mean Temperature of Evaporation .....	60·2	59·7
Mean Temperature of Dew Point.....	56·4	56·0
Mean elastic force of Vapour.....inches	0·474	0·449
Mean weight of Vapour in a cub. ft of air grains	5·1	5·1
Mean additional weight required for saturation,.	1·9	1·8
Mean degree of Humidity .....	78	76
Mean weight of a cubic foot of air ....grains	527·6	528·0
Fall of rain .....	inches 25·159	19·204
Number of days on which rain fell .....	90	76
Mean amount of Cloud (an overcast sky 10)	4·6	3·5
Total number of miles of wind indicated.....	80037	84749
Mean Velocity of Wind per hour.....miles	9·2	9·7

SINCE MAY, 1883.

The Maximum monthly mean height of the Barometer was  
in November, 1889, and was .....inches 30·

The Minimum in January, 1886, and was





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STONYHURST COLLEGE  
OBSERVATORY,  
LANCASHIRE.

*With FATHER SIDGREAVES'*  
*COMPLIMENTS.*

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STONYHURST COLLEGE  
OBSERVATORY.

RESULTS

OF

METEOROLOGICAL, MAGNETICAL.

AND

SOLAR OBSERVATIONS

BY THE

REV. W. SIDGREAVES, S.J., F.R.A.S.

1895

CLITHEROE:

PRINTED BY PARKINSON AND BLACOW, TIMES OFFICE.

1896



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## INTRODUCTION.

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The work of the Meteorological and Magnetical department has been carried on as described in the Introduction 1892. The weekly reports have been sent regularly to the Meteorological Office, and the monthly report to the Registrar General. Occasional special reports have also been supplied to applications.

The new Stonyhurst Sunshine Recorder, made by Messrs. Newton and Co., has been tested by comparisons with the Campbell Stokes Recorder of the Meteorological Office, and has been found to work very satisfactorily.

Two additions have been made to the Magnetic Report, compiled from the measures of the daily curves of Horizontal Direction and Force. These consist of the Monthly Means of the greatest and least measures of each day, and of the measures at 4-0 a.m. and 4-0 p.m. The Highest and Lowest readings of each month and the resulting ranges are also entered, and the differences between the mean of the Highest and Lowest readings, and that of the readings at 4 a.m. and 4 p.m. All the figures in the table are entered without correction for temperature. The adopted annual mean is corrected for the diurnal range, the correction being taken from the Kew Reports 1891, 92, 93, 94; and is the mean of the range quoted in those years for the hours 4 a.m. and 4 p.m.

The scale value of the bifilar magnetometer was measured by the method of deflections, in May ; and was found to be for one centimetre :—

	in 1895,	0·000513	C.G.S. units.
It was	1894,	0·000512	„
„	1893,	0·000511	„
„	1892,	0·000515	„

On October 12th, an accident occurred in the Magnetic Chamber, which resulted in a gas explosion. This seems to have shaken the base line reflector of the bifilar. A re-measurement of the scale value was made on February 10th, 1896, which gave the figure 0·000514, and showed that no further injury had been done.

The adopted reading of the bifilar base line is 0·16871 C.G.S., up to October 12, and the subsequent reading is 0·16945. These are the mean values obtained from the monthly absolute measures. The latter reading consequently depends upon three measures only : the former is the mean of the measures from January, 1892 to October, 1895.

The scale value of the Unifilar is 11 '28 per centimetre. And its base line value deduced from the weekly absolute measures at 4 p.m. is 17° 45'.7.

No reductions of the vertical force curves have been made ; because, in the judgment of the Director, these curves, though of great value in connection with the character of disturbances, cannot be relied upon for accurate measurements.

The instruments for absolute measures of the Magnetic elements were compared in August with the instruments adopted as standards by the Physical section of the British Association for the advancement of science : with the object of co-ordinating the measures obtained at the several Magnetic Observatories of the United Kingdom. The results of these comparisons are expected at the next meeting of the same Association. It seems probable at present that our instruments, and notably those of the horizontal and vertical directions, are not free from a disturbing magnetic influence, residing either in the wooden boxes, or in the metal supports. The axles of the dipping



needles and the agate knife edges may also be faulty ; but it has not been thought advisable to make any alterations before the complete report has been made out and discussed.

Drawings of the solar spots and faculae have been made on nearly all the days on which it was possible, without too great an expenditure of time in waiting for clear intervals. And, in connection with them, photographs of the H-K region of the solar spectrum have been taken with the grating spectrograph, with the object of observing how closely the double reversals by integrated solar light follow the disturbances of the solar surface.

A wave-length chart of the spectra of 43 of the brighter stars has been made from the photographs obtained with the old eight-inch Objective.

The spectroscopic experimental work with the Father Perry Memorial objective was not completely finished until the end of April. These experiments represent a large number of photographic stellar spectra ; but they are of no value for measurements, having been taken with thirteen different collimators and seven different camera lenses. Several prisms have also been tried, but not all photographically. The finally adopted arrangement is a slitless spectrograph of one (or two) direct compound prisms of three components each, with a concave compound collimator to correct the dispersed photographic rays between D and H to parallelism.

A very satisfactory wave-length curve has been plotted for the one prism ; and another for the two prisms will shortly be made.

A new series of photographs of the spectrum of  $\beta$  Lyrae has been made, 77 plates in all ; and, of these, 39, or three good plates for each day of the light period, have been selected for measurement. The measurements were well advanced, but not complete at the close of the year.

WALTER SIDGREAVES, S.J.



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LTER SIDGREAVES, S.J.

# Stonyhurst Observatory.

Lat. 53° 50' 40" N. Long. 9m. 52<sup>s</sup>.68. W. Height of the Barometer  
above the sea 381ft.

## METEOROLOGICAL REPORT.

JANUARY, 1895.

Result of Observations taken during the Month.		Mean for the last 48 years.
Mean Reading of the Barometer....inches	29.296	29.436
Highest                   ,,                   on the 30th                   ,,	30.222	30.280
Lowest                   ,,                   on the 14th                   ,,	28.511	28.585
Range of Barometer Readings .....	1.711	1.695
Highest Reading of a Max. Therm. on the 2nd	44.2	51.4
Lowest Reading of a Min. Therm. on the 27th	15.1	20.3
Range of Thermometer Readings .....	29.1	31.1
Mean of all the Highest Readings .....	36.8	42.1
Mean of all the Lowest Readings .....	25.7	32.3
Mean Daily Range ..	11.1	9.8
Deduced Monthly Mean (from Mean of Max. and Min.) .....	31.1	36.9
Mean Temperature from Dry Bulb .....	31.5	37.0
Adopted Mean Temperature .....	31.3	37.0
Mean Temperature of Evaporation.....	29.7	35.8
Mean Temperature of Dew Point .....	25.6	33.6
Mean elastic force of Vapour .....	0.138in	0.194in
Mean weight of Vapour in a cub. ft. of air ....	1.6gr	2.4gr
Mean additional weight required for saturation	0.5gr	0.4gr
Mean degree of Humidity (saturation 1.00) ...	0.79	0.86
Mean weight of a cubic foot of air .....	554.0gr	549.6gr
Fall of Rain .....	2.800in	4.113in
Number of days on which Rain fell .....	22	19.8

## JANUARY, 1895.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	13	4	6	0	0	0	5	3
Mean Velocity in miles per hour	15.5	9.1	16.2	0	0	0	11.6	7.1
Total No. of miles for each Direction	4848	870	2337	0	0	0	1392	511

The total No. of miles registered during the month was 9958.

The max. Velocity of the wind was 39 miles per hour. Direction E. on the 13th at 7 a.m.

Mean amount of Cloud (an overcast sky being indicated by 10.0) 7.0

In the month of January, the highest reading of the Barometer during 48 years, was on the 18th in 1882, and was 30.480

The lowest ,, 26th, 1884 ,, .... 27.803

The highest Temperature 7th, 1887 ,, .... 59.9

The lowest ,, 15th, 1881 ,, .... 4.6

The highest adopted mean temperature of the month, 1875 42.5

The lowest ,, ,, 1881.... 29.2

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0.140 inches
Monthly range	..	..	+	0.016 ,,
Mean of highest temperatures	..	..	—	5.3 degrees
Mean of lowest	..	..	—	6.6 ,,
Mean daily range	..	..	+	1.3 ,,
Adopted mean temperature	..	..	—	5.7 ,,
Total rainfall	..	..	—	1.313 inches

Frost every day except the 20th, on which day the lowest ground temperature was 33°. Snow on 14 days; hail on 5 days; lightning on the 24th; thunder on the 27th.

## FEBRUARY, 1895.

Results of Observations taken during the Month.		Mean for the last 48 years.
Mean Reading of the Barometer.....	29·704	29·510
Highest                   ,,                   on the 16th....	30·188	30·067
Lowest                   ,,                   on the 26th....	29·265	28·694
Range of Barometer Readings.....	0·923	1·373
Highest Reading of a Max. Therm. on the 24th	44·3	52·0
Lowest Reading of a Min. Therm. on the 7th	8·0	22·1
Range of Thermometer Readings .....	36·3	29·9
Mean of all the Highest Readings .....	36·2	44·2
Mean of all the Lowest Readings.....	22·8	33·4
Mean Daily Range .....	13·4	10·8
Deduced Monthly Mean (from Mean of Max. and Min.) .....	29·1	38·2
Mean Temperature from Dry Bulb .....	28·8	38·2
Adopted Mean Temperature.....	29·0	38·2
Mean Temperature of Evaporation.....	27·0	36·7
Mean Temperature of Dew Point.....	21·2	34·5
Mean elastic force of Vapour .....	0·113 in	0·192 in
Mean weight of Vapour in a cub. ft. of air ..	1·4 gr	2·4 gr
Mean additional weight required for saturation	0·5 gr	0·4 gr
Mean degree of Humidity (saturation 1·00) ..	0·072	0·87
Mean weight of a cubic foot of air .....	564·4 gr	548·9 gr
Fall of Rain .....	0·553 in	3·493 in
Number of days on which Rain fell.....	6	16·9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	9	8	10	0	2	2	2	0
Mean Velocity in miles per hour	5·6	7·6	8·8	0	6·3	5·0	11·2	0
Total No. of miles for each Direction	1205	545	2123	0	301	240	536	0

The total number of miles registered during the month was 4950.  
The max. Velocity of the wind was 31 miles per hour. Direction E. by N., on the 16th, at 7-0 a.m.

## FEBRUARY, 1895.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 6·0

In the month of February, the highest reading of the Barome-

ter during 48 years, was on the 11th, in 1849, and was .. 30·452

The lowest ,, 6th, 1867 ,, .... 28·208

The highest Temperature 8th, 1877 ,, .... 58·3

The lowest ,, 18th, 1895 ,, .... 8·0

The highest adopted mean temperature of the month, 1869.... 44·0

The lowest ,, ,, 1855.... 28·6

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure .. .. + 0·194 inches

Monthly range ,, .. — 0·450 ,,

Mean of highest temperatures .. .. — 8·0 degrees

Mean of lowest ,, .. — 10·6 ,,

Mean daily range ,, .. + 2·6 ,,

Adopted mean temperature .. .. — 9·2 ,,

Total rainfall .. .. — 2·940 inches

Frost every day of the month. During the week from 7th to 13th, the ground temperatures were respectively 8°, 5°, 4°, 9°, 16°, 4°, and 8° Fahr. Hoar Frost on the 20th and 22nd. Snow on 11 days. Fog on the 23rd and 28th. Aurora Borealis on the 15th and 24th.





## MARCH, 1895.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				8·1
In the month of March, the highest reading of the Barometer during 48 years, was on the 6th, in 1852, and was....				
The lowest	„	28th, 1895	„	.. 28·194
The highest Temperature	„	25th, 1871	„	.. 68·0
The lowest	„	6th, 1886	„	.. 11·5
The highest adopted mean temperature of the month, 1871..				44·0
The lowest	„	„	1855 and 1892	.. 35·6

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0·028 inches
Monthly range	„	..	+	0·333 „
Mean of highest temperature	..	..	+	0·9 degrees
Mean of lowest	„	..	+	0·5 „
Mean daily range	„	..	+	0·4 „
Adopted mean temperature	..	..	+	0·4 „
Total rainfall	..	..	+	1·244 inches

The lowest barometer reading for the month of March during the last 48 years was recorded on the 28th, when the mercury stood at 28·194 inches at 9·0 a.m. Frost on the 7th. An inch of rain fell on the 23rd. The aurora of the 13th was remarkable as a narrow belt of luminescence extending from east to west, a little north of zenith.

## APRIL, 1895.

Results of Observations taken during the Month.		Mean for the last 48 years.
Mean Reading of the Barometer .....	29.455	29.484
Highest ,, on the 12th....	29.992	29.969
Lowest ,, on the 6th .....	28.775	28.804
Range of Barometer Readings .....	1.217	1.165
Highest Reading of a Max. Therm. on the 29th	63.0	66.1
Lowest Reading of a Min. Therm. on the 7th	26.5	28.1
Range of Thermometer Readings .....	36.5	38.0
Mean of all the Highest Readings .....	56.2	55.9
Mean of all the Lowest Readings .....	37.4	37.8
Mean Daily Range .....	18.8	18.1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	45.3	44.5
Mean Temperature from Dry Bulb .....	45.3	44.6
Adopted Mean Temperature .....	45.3	44.5
Mean Temperature of Evaporation .....	42.5	41.7
Mean Temperature of Dew Point .....	39.3	38.2
Mean elastic force of Vapour .....	0.241in	0.236in
Mean weight of Vapour in a cub. ft. of air ..	2.8gr	2.7gr
Mean additional weight required for saturation	0.7gr	0.7gr
Mean degree of Humidity (saturation 1.00)..	0.80	0.80
Mean weight of a cubic foot of air .....	541.3gr	542.0gr
Fall of Rain .....	2.648in	2.266in
Number of Days on which rain fell .....	14	14.6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	7	3	0	5	3	10	0
Mean Velocity in miles per hour	7.0	7.7	10.5	0	11.1	14.8	11.3	0
Total No. of miles for each Direction	336	1300	753	0	1333	1062	2718	0

The total number of miles registered during the month was 7502.  
The max. Velocity of the wind was 36 miles per hour. Direction W.S.W., on the 6th at 4 p.m.

## APRIL, 1895.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	7·4
In the month of April, the highest reading of the Barometer	
during 48 years, was on the 17th, in 1887, and was.....	30·251
The lowest                   ,,           20th, 1868                   ,,           .....	28·358
The highest Temperature       14th, 1852                   ,,           .....	74·1
The lowest                   ,,           13th, 1892                   ,,           .....	20·8
The highest adopted mean temperature of the month, 1865....	48·5
The lowest                   ,,                                   ,,                                   1879 ....	40·7

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0·029 inches
Monthly range	..	..	+	0·052   ,,
Mean of highest temperatures	..	..	+	0·3 degrees
Mean of lowest	..	..	—	0·4   ,,
Mean daily range	..	..	+	0·7   ,,
Adopted mean temperature	..	..	+	0·8   ,,
Total rainfall	..	..	+	0·382 inches

Frost on 12 days.   Snow on the 3rd.   Hail on the 24th  
Thunder on the 21st and 24th.   Lightning on the 24th.   Lunar  
halo on the 4th.   Aurora on the 23rd.

1855

Mean for the last 46 years.	
Mean of the day	29.484
Mean of the night	29.969
Mean of the day and night	28.804
Mean of the day and night	1.165
Mean of the day and night	66.1
Mean of the day and night	28.1
Mean of the day and night	38.0
Mean of the day and night	55.9
Mean of the day and night	37.8
Mean of the day and night	18.1
Mean of the day and night	45.3
Mean of the day and night	44.6
Mean of the day and night	44.5
Mean of the day and night	41.7
Mean of the day and night	38.2
Mean of the day and night	0.241in
Mean of the day and night	2.8gr
Mean of the day and night	0.7gr
Mean of the day and night	0.80
Mean of the day and night	541.3gr
Mean of the day and night	2.648in
Mean of the day and night	14

Mean of the day and night

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**APRIL, 1895.**


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Mean amount of Cloud (an overcast sky being indicated by 100)	74
the month of April, the highest reading of the Barometer	
during 48 years, was on the 7th. in 1867, and was.....	30.251
the lowest                    "           20th. 1868                    "	29.256
the highest Temperature   14th. 1852                    "	74.1
the lowest                    "           13th. 1892                    "	30.8
the highest adopted mean temperature of the month, 1863.....	48.5
the lowest                    "                                    1879 .....	40.7

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**TABLE OF DIFFERENCES.**

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0.029 inches
Monthly range                    "	..	..	+	0.052   "
Mean of highest temperatures	..			
Mean of lowest                    "	..			
Mean daily range                   "	..			
Adopted mean temperature	..			
Total rainfall                    "	..			

Frost on 12 days. Snow on th

Thunder on the 21st and 24th. Lig

halo on the 4th. Aurora on the 23rd.

## MAY, 1895.

Results of Observations taken during the Month		Mean for the last 48 years.
Mean Reading of the Barometer.....	29·695	29·509
Highest                    "                   on the 2nd.....	30·217	29·950
Lowest                    "                   on the 31st .....	29·271	28·947
Range of Barometer Readings.....	0·946	1·003
Highest Reading of a Max. Therm. on the 30th	80·5	72·1
Lowest Reading of a Min. Therm. on the 1st	32·6	31·3
Range of Thermometer Readings .....	47·9	40·8
Mean of all the Highest Readings.....	65·0	59·8
Mean of all the Lowest Readings .....	43·5	42·1
Mean Daily Range..... ..	21·5	17·7
Deduced Monthly Mean (from Mean of Max. and Min.) .....	52·5	49·1
Mean Temperature from Dry Bulb.....	52·7	49·6
Adopted Mean Temperature .....	52·6	49·3
Mean Temperature of Evaporation .....	48·1	46·1
Mean Temperature of Dew Point .....	43·6	42·6
Mean elastic force of Vapour .....	0·283 in	0·276 in
Mean weight of Vapour in a cubic ft. of air ....	3·3gr	2·3gr
Mean additional weight required for saturation	1·3gr	0·9gr
Mean degree of Humidity (saturation 1·00)..	0·72	0·76
Mean weight of a cubic foot of air .....	537·0gr	537·0gr
Fall of Rain.....	0·500 in	2·596 in
Number of days on which Rain fell.....	9	15·3

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	8	4	5	0	3	2	7	2
Mean Velocity in miles per hour	8·9	5·2	10·3	0	9·7	4·4	8·3	14·7
Total No. of miles for each Direction	1705	497	1232	0	697	210	1392	708

The total number of miles registered during the month was 6441.  
The max. Velocity of the wind was 33 miles per hour. Direction N.W. by W., on the 15th, at 1 a.m.

## MAY, 1895.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	6·0
In the month of May, the highest reading of the Barometer during 48 years, was on the 2nd in 1895, and was.....	30·217
The lowest                   ,,           28th, 1877                   ,,           .....	28·559
The highest Temperature   19th, 1864                   ,,           .....	82·5
The lowest                   ,,           4th, 1855                   ,,           .....	23·5
The highest adopted mean temperature of the month, 1848	55·1
The lowest                   ,,                                   ,,                                   1855	45 0

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	+	0·186 inches
Monthly range           ,,	..	..	—	0·057   ,,
Mean of highest temperatures	..	..	+	5·2 degrees
Mean of lowest           ,,	..	..	+	1·4   ,,
Mean daily range       ,,	..	..	+	3·8   ,,
Adopted Mean temperature	..	..	+	3·3   ,,
Total rainfall       ..       ..       ..	..	..	—	2·096 inches

The highest barometer reading for the month of May during the last 48 years was recorded on the 2nd, the reading being 30·217 inches at 10-15 p.m. Frost on the 2nd and 3rd; thunder on the 24th, 25th, and 30th; Lightning on the 25th and 30th; lunar halos on the 5th, 7th, and 8th.

## JUNE, 1895.

Results of Observations taken during the Month.		Mean for the last 48 years.
Mean Reading of the Barometer .....	29·659	29·544
Highest                   ,,                   on the 24th   ∴	30·049	29·897
Lowest                   ,,                   on the 29th   ...	29·162	29·035
Range of Barometer Readings.....	0·887	0·862
Highest Reading of a Max. Therm. on the 25th	83·2	77·4
Lowest Reading of a Min. Therm. on the 15th	36·3	38·7
Range of Thermometer Readings .....	46·9	38·7
Mean of all the Highest Readings .....	69·2	65·8
Mean of all the Lowest Readings .....	45·8	47·8
Mean Daily Range .....	23·4	18·0
Deduced Monthly Mean (from Mean of Max. and Min.) .....	55·7	55·0
Mean Temperature from Dry Bulb) .....	56·0	55·1
Adopted Mean Temperature ... ..	55·9	55·0
Mean Temperature of Evaporation .....	51·9	52·0
Mean Temperature of Dew Point .....	48·1	48·5
Mean elastic force of Vapour .....	0·339 in	0·354 in
Mean weight of Vapour in a cub. ft. of air	3·8gr	3·9gr
Mean additional weight required for saturation	1·2gr	0·9gr
Mean degree of Humidity (saturation 1·00)	0·76	0·79
Mean weight of a cubic foot of air.....	532·8gr	531·3gr
Fall of Rain .....	3·423 in	3·618 in
Number of days on which Rain fell .....	13	16·1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	1	4	0	2	2	20	0
Mean Velocity in miles per hour	3·4	4·3	5·4	0	8·7	5·6	7·4	0
Total No. of miles for each Direction.	81	103	518	0	417	270	3574	0

The total number of miles registered during the month was 4963.  
The max. Velocity of the wind was 23 miles per hour. Direction W. on the 11th at 1 p.m.



**JUNE, 1895.**

Mean amount of Cloud (an overcast sky being indicated by 10·0)	6·5
In the month of June, the highest reading of the Barometer during 48 years, was on the 15th, in 1874, and was .....	30·219
The lowest ,, 23rd, 1893 ,, .....	28·813
The highest Temperature 18th, 1893 ,, .....	88·7
The lowest ,, 17th, 1892 ,, .....	34·1
The highest adopted mean temperature of the month, 1858 ..	59·0
The lowest ,, ,, 1856 and 1860 ..	52·2

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	+	0·115 inches
Monthly range	„	..	+	0·025 „
Mean of highest temperatures	..	..	+	3·4 degrees
Mean of lowest	„	..	—	2·0 „
Mean daily range	„	..	+	5·4 „
Adopted mean temperature	..	..	+	0·9 „
Total rainfall	..	..	—	0·195 inches

A heavy thunderstorm occurred on the 1st, accompanied with 1.118 inches of rain. Thunder was also heard on the 26th, 27th, 28th, 29th, and 30th. Lightning on the 1st, 29th, and 30th.

## JULY, 1895.

Results of Observations taken during the Month.		Mean for the last 48 years
Mean Reading of the Barometer.....	29.410	29.499
Highest                   ,,                   on the 6th.....	29.857	29.879
Lowest                   ,,                   on the 21st .....	28.957	28.990
Range of Barometer Readings .....	0.900	0.889
Highest Reading of a Max. Therm. on the 8th	77.0	78.8
Lowest Reading of a Min. Ther. on the 29th & 31st	41.0	42.1
Range of Thermometer Readings .....	36.0	36.7
Mean of all the Highest Readings.....	68.3	67.8
Mean of all the Lowest Readings.....	48.9	50.7
Mean Daily Range .....	19.4	17.1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	56.7	57.7
Mean Temperature from Dry Bulb .....	56.3	57.7
Adopted Mean Temperature .....	56.5	57.7
Mean Temperature of Evaporation .....	53.4	54.7
Mean Temperature of Dew Point.....	50.5	52.1
Mean elastic force of Vapour .....	0.368in	0.389in
Mean weight of Vapour in a cub. ft. of air ... ..	4.1gr	4.5gr
Mean additional weight required for saturation	1.0gr	1.0gr
Mean degree of Humidity (saturation 1.00)...	0.80	0.82
Mean weight of a cubic foot of air .....	528.3gr	527.3gr
Fall of Rain .....	5.319in	4.247in
Number of days on which Rain fell.....	20	18.1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	0	0	0	3	7	18	0
Mean Velocity in miles per hour	6.3	0	0	0	7.4	8.1	11.8	0
Total No. of miles for each Direction	455	0	0	0	532	1366	5088	0

The total number of miles registered during the month was 7441.  
The max. Velocity of the wind was 87 miles per hour. Direction W. by S., on the 14th at Noon.

## JULY, 1895.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·7

In the month of July, the highest reading of the Barometer

during 48 years, was on the 24th, in 1868, and was ..... 30·112

The lowest                   ,,           15th, 1877           ,,           ..... 28·564

The highest Temperature   22nd, 1873           ,,           ..... 88·2

The lowest                   ,,           1st, 1857           ,,           ..... 36·0

The highest adopted mean temperature of the month, 1852.... 63·0

The lowest                   ,,                   ,,           1888.... 54·5

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TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure   ..           .. — 0·089 inches

Monthly Range               ,,           .. + 0·011   ,,

Mean of highest temperatures . ..           .. + 0·5 degrees

Mean of lowest               ,,           .. — 1·8   ,,

Mean daily range           ,,           .. + 2·3   ,,

Adopted mean temperature   ..           .. — 1·2   ,,

Total rainfall               ..           .. + 1·072 inches

Thunder on the 1st, 2nd, 3rd, 7th, 21st and 26th. Lightning on the 1st, 2nd, 21st and 26th.

## AUGUST, 1895.

Results of Observations taken during the Month		Mean for the last 48 years.
Mean Reading of the Barometer.....	29·417	29·487
Highest               ,,               on the 15th .....	29·817	29·883
Lowest               ,,               on the 3rd.....	28·846	28·944
Range of Barometer Readings .....	0·971	0·939
Highest Reading of a Max. Therm. on the 17th	78·0	77·0
Lowest Reading of a Min. Therm. on the 24th	41·6	41·2
Range of Thermometer Readings .....	36·4	35·8
Mean of all the Highest Readings .....	68·9	67·2
Mean of all the Lowest Readings .....	51·6	50·4
Mean Daily Range.....	17·3	16·8
Deduced Monthly Mean (from Mean of Max. and Min.) .....	58·6	57·1
Mean Temperature (deduced from Dry Bulb)	58·7	57·5
Adopted Mean Temperature .....	58·7	57·3
Mean Temperature of Evaporation ..	55·6	54·5
Mean Temperature of Dew Point .....	52·8	51·9
Mean elastic force of Vapour .....	0·401 in	0·388 in
Mean weight of Vapour in a cub. ft. of air .....	4·4 gr	4·3 gr
Mean additional weight required for saturation	1·0 gr	0·9 gr
Mean degree of Humidity (saturation 1·00)...	0·81	0·82
Mean weight of a cubic foot of air.....	525·1 gr	527·3 gr
Fall of Rain.. .....	5·199 in	5·072 in
Number of days on which Rain fell .....	21	19·1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	0	0	0	2	12	15	1
Mean Velocity in miles per hour	4·3	0	0	0	11·5	9·7	8·8	3·0
Total No. of miles for each Direction	102	0	0	0	550	2806	3181	71

The total number of miles registered during the month was 6710.  
The max. Velocity of the wind was 34 miles per hour. Direction W.S.W., at Noon.

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SEPTEMBER, 1895.

**Mean amount of Cloud (an overcast sky being indicated by 10·0) 4·9**

In the month of September, the highest reading of the Barometer during 47 years, was on the 15th, in 1851, and was... 80.274

**The lowest                „                2nd, 1883                „                ... 28·323**

The highest Temperature	6th, 1868	„	...	85·0
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The lowest	„	25th, 1885, and 30th, 1888...	29·8
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**The highest adopted mean temperature of the month, 1865 ... 59.1**

**The lowest**                      „                      „                      1863 ...    50·9

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure .. .. + 0.182 inches

Monthly range                    ..                    ..                    .. — 0.288                    ..

**Mean of highest temperatures .. .. + 6·9 degrees**

Mean of lowest            „            ..            ..    +    3.0    „

Mean daily range        „        ..        ..    +    3.9    „

Adopted mean temperature .. .. + 4.4 „

**Total rainfall .. .. — 2·501 inches**

Hoar frost on the 16th and 26th. Thunder on the 3rd and 10th. Lightning on the 3rd, 9th, 23rd, and 24th.

## OCTOBER, 1895.

Results of Observations taken during the Month.		Mean for the last 48 years.
Mean Reading of the Barometer.....	29·410	29·423
Highest                    "                   on the 17th....	30·161	30·018
Lowest                    "                   on the 3rd ....	28·653	28·639
Range of Barometer Readings.....	1·508	1·379
Highest Reading of a Max. Therm. on the 1st	70·0	64·3
Lowest Reading of a Min. Therm. on the 28th	17·8	28·8
Range of Thermometer Readings .....	52·2	35·5
Mean of all the Highest Readings .....	52·1	54·5
Mean of all the Lowest Readings .....	35·7	41·5
Mean Daily Range.....	16·4	13·0
Deduced Monthly Mean (from Mean of Max. and Min.) .....	42·9	47·1
Mean Temperature from Dry Bulb .....	42·6	47·6
Adopted Mean Temperature .....	42·8	47·3
Mean Temperature of Evaporation .....	40·3	45·1
Mean Temperature of Dew Point .....	37·3	42·7
Mean elastic force of Vapour .....	0·223in	0·275in
Mean weight of Vapour in a cub. ft. of air ....	2·6gr	3·1gr
Mean additional weight required for saturation	0·6gr	0·6gr
Mean degree of Humidity (saturation 1·00)..	0·82	0·84
Mean weight of a cubic foot of air.....	542·5gr	537·5gr
Fall of Rain .....	5·767 in	5·081in
Number of days on which Rain fell .....	20	21·7

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	8	5	0	0	0	4	10	4
Mean Velocity in miles per hour	5·7	4·5	0	0	0	6·8	11·1	6·2
Total No. of miles for each Direction.	1098	535	0	0	0	656	2671	593

The total number of miles registered during the month was 5553.  
The max. Velocity of the wind was 89 miles per hour. Direction W. S. W., on the 2nd at 5 p.m.



OCTOBER, 1895.

Mean amount of Cloud(an overcast sky being indicated by 10·0)					6·7
In the month of October, the highest reading of the Barometer during 48 years, was on the 5th, in 1884, and was ....					30·306
The lowest	„	19th, 1862	„	....	28·139
The highest Temperature		9th, 1869	„	....	72·8
The lowest	„	28th, 1895	„	....	17·8
The highest adopted mean temperature of the month, 1861 & '76					51·6
The lowest	„	„	1895....		42·8

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0·013 inches
Monthly range	„	..	+	0·129 „
Mean of highest temperatures	..	..	—	2·4 degrees
Mean of lowest	„	..	—	5·8 „
Mean daily range	„	..	+	3·4 „
Adopted mean temperature	..	..	—	4·5 „
Total rainfall	..	..	+	0·686 inches

Both the minimum temperature  $17.8^{\circ}$  on the 28th, and the adopted mean temperature  $42.8^{\circ}$ , are the lowest recorded for the month of October for the last 48 years. Frost on 14 days. Snow on the 24th, 25th, and 26th. Hail on the 2nd and 3rd. Fog on the 25th. Thunder on the 2nd. Lightning on the 2nd and 25th. A fall of  $1\frac{1}{2}$  inches of rain on the 30th.

## DECEMBER, 1895.

Results of Observations taken during the Month.		Mean for the last 48 years.
Mean Reading of the Barometer .....	29·330	29·458
Highest                   ,,                   on the 27th	30·021	30·075
Lowest                   ,,                   on the 16th	28·540	28·594
Range of Barometer Readings .....	1·481	1·481
Highest Reading of a Max. Therm. on the 5th	52·5	53·0
Lowest Reading of a Min. Therm. on the 19th	23·0	20·1
Range of Thermometer Readings .....	29·5	32·9
Mean of all the Highest Readings .....	44·0	43·0
Mean of all the Lowest Readings .....	33·3	32·9
Mean Daily Range .....	10·7	10·1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	38·7	37·9
Mean Temperature from Dry Bulb .....	38·6	38·6
Adopted Mean Temperature .....	38·7	38·3
Mean Temperature of Evaporation.....	37·0	36·7
Mean Temperature of Dew Point .....	34·7	34·9
Mean elastic force of Vapour .....	0·202 in	0·204 in
Mean weight of Vapour in a cub. ft. of air	2·3 gr	2·4 gr
Mean additional weight required for saturation	0·4 gr	0·4 gr
Mean degree of Humidity (saturation 1·00 ..)	0·86	0·87
Mean weight of a cubic foot of air .....	544·9 gr	548·4 gr
Fall of Rain .....	6·005 in	5·273 in
Number of days on which Rain fell .....	18	18·9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	4	8	1	1	3	13	1
Mean Velocity in miles per hour	0	5·7	12·4	12·1	19·8	11·6	15·2	30·8
Total No. of miles for each Direction	0	546	2381	291	476	834	4728	740

The total number of miles registered during the month was 9996.  
The max. Velocity of the wind was 49 miles per hour. Direction N.W. by W., on the 13th at noon.

## DECEMBER, 1895.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·3

In the Month of December, the highest reading of the Barometer during 48 years, was on the 22nd, in 1849, and was 30·378

The lowest „ 8th, 1886 „ .... 27·350

The highest Temperature 9th, 1876 „ .... 58·1

The lowest „ 24th, 1860 „ .... 6·7

The highest adopted mean temperature of the month 1857.. 44·6

The lowest „ 1878 „ .... 30·3

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0·128 inches
Monthly range „	..	..		average range
Mean of highest temperatures	..	..	+	1·0 degrees
Mean of lowest „	..	..	+	0·4 „
Mean daily range „	..	..	+	0·6 „
Adopted mean temperatures	..	..	+	0·4 „
Total rainfall ..	..	..	+	0·732 inches

Frost on 22 days. Snow on 5 days. Hail on 6 days. 1·000 inches of rain fell on the 4th. Fog on the 9th. Lightning on the 5th, 6th, and 12th. Aurora on the 7th.

## AUGUST, 1895.

s taken during the Month		Mean for the last 48 years.
rometer.....	29 417	29 487
on the 15th .....	29 817	29 883
on the 3rd.....	28 846	28 944
adings .....	0 971	0 939
x. Therm. on the 17th	78 0	77 0
. Therm. on the 24th	41 6	41 2
Readings .....	36 4	35 8
Readings .....	68 9	67 2
Readings .....	51 6	50 4
.....	17 8	16 8
(from Mean of Max.		
.....	58 6	57 1
iced from Dry Bulb)	58 7	57 5
ture .....	58 7	57 3
vaporation ..	55 6	54 5
ew Point .....	52 8	51 9
pour ...	0 401 in	0 388 in
n a cub. ft of air .....	4 4 gr	4 3 gr
quired for saturation	1 0 gr	0 9 gr
y (saturation 1 00)...	0 81	0 82
foot of air.....	525 1 gr	527 3 gr
.....	5 199 in	5 072 in
h Rain fell .....	21	19 1

No of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	0	0	0	0	0	5	1

Mean Velocity in miles per hour	4 3	0	0	0	11 5	9 7	8 8	3 0
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Total No. of miles for each Direction	102	0	0	0	550	2806	3181	71
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The total number of miles registered during the month was 6710

The max. Velocity of the wind was 34 miles per hour. Direction

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AUGUST, 1895.

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Mean amount of Cloud (an overcast sky being indicated by 10·0)	8·7
In the month of August, the highest reading of the Barometer during 48 years, was on the 21st, in 1874, and was ....	30·114
The lowest ,, 31st, 1876 ,, ..	28·555
The highest Temperature 2nd, 1868 ,, ....	88·0
The lowest ,, 13th, 1887 ,, ....	33·4
The highest adopted mean temperature of the month, 1857 & '84	61·0
The lowest ,, ,, 1848 ....	52·5

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0·070 inches
Monthly range	„	..	+	0·032 „
Mean of highest temperatures	..	..	+	1·7 degrees
Mean of the lowest	„	..	+	1·2 „
Mean daily range	„	..	+	0·5 „
Adopted mean temperature	..	..	+	1·4 „
Total rainfall	..	..	+	0 127 „

1.320 inches of rain fell on the 26th Thunder on the 3rd, 10th, 12th, 13th, 17th, 23rd, and 27th. Lightning on the 10th, 22nd, and 23rd.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	5	1	0	5	7	12	0
Mean Velocity in miles per hour	0	4.2	3.5	0	3.8	6.1	9.0	0
Total No. of miles for each Direction	0	496	83	0	451	1023	2590	0
<p>The total number of miles registered during the month was 4645.  The max. Velocity of the wind was 37 miles per hour. Direction W S.W., at 3 p.m.</p>								

## SEPTEMBER, 1895.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				4·9
In the month of September, the highest reading of the Bar-				
ometer during 47 years, was on the 15th, in 1851, and was...				30·274
The lowest	„	2nd, 1883	„	... 28·323
The highest Temperature		6th, 1868	„	... 85·0
The lowest	„	25th, 1885, and 30th, 1888...		29·8
The highest adopted mean temperature of the month, 1865 ...				59·1
The lowest	„	„	1863	... 50·9

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	+	0·182 inches
Monthly range	„	..	—	0·288 „
Mean of highest temperatures	..	..	+	6·9 degrees
Mean of lowest	„	..	+	3·0 „
Mean daily range	„	..	+	3·9 „
Adopted mean temperature	..	..	+	4·4 „
Total rainfall	..	..	—	2·501 inches

Hoar frost on the 16th and 26th. Thunder on the 3rd and 10th. Lightning on the 3rd, 9th, 23rd, and 24th.

# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January - -	3.9	0	4.4	2.2	0.4	0	1.4	2.6	0.6	0	1.2	0	0	0	0.2	0	0
February - -	0	0.4	1.6	3.9	4.7	0	0.8	7.5	3.8	2.4	6.5	7.5	4.5	6.0	2.8	8.7	1.4
March - -	3.0	4.2	4.8	6.7	2.3	0	0	2.7	1.6	1.2	0.8	2.5	8.7	0	0	2.3	4.3
April - -	5.4	7.7	2.4	7.4	0.8	0	9.4	0.3	10.7	5.6	10.5	4.3	5.0	10.8	12.5	12.5	0.6
May - -	2.5	12.9	11.4	7.0	12.7	14.1	13.9	12.0	7.0	14.0	13.8	0	1.0	1.5	7.3	14.4	0.4
June - -	0.8	0	2.5	5.5	7.5	10.9	14.9	8.4	9.8	12.7	8.5	12.7	10.7	6.8	14.7	15.4	3.7
July - -	2.2	2.6	3.7	6.8	12.7	12.0	13.4	10.7	9.7	8.8	0.4	7.6	7.7	6.3	5.8	0	1.7
August - -	0	6.2	1.0	4.8	5.1	1.0	5.5	5.7	3.0	3.4	6.3	4.9	4.1	8.8	0.8	0	8.4
September - -	7.9	10.0	0.7	4.1	0	5.4	5.3	6.5	8.3	1.9	3.7	4.2	10.4	0.8	7.2	0.5	0.8
October - -	1.7	0.4	0	7.0	0	7.4	4.9	0	1.8	5.3	6.4	0	0	0	0	8.8	5.7
November - -	1.2	0	0	0	0	2.4	0	0.9	0.2	0.8	4.0	5.3	5.3	0.5	0	0	3.4
December - -	1.0	0.1	3.5	0	0	2.4	1.0	0	0	1.8	0	0	2.5	0	1.9	0	1.4



# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

(Continued.)

MONTH.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Per centage each month.
January -	2.5	0	0	5.8	3.8	6.4	0	3.1	4.8	0.6	6.7	0	4.8	1.4	56.8	21.9
February -	0	1.7	3.6	3.2	0.7	0.3	1.7	3.5	0	6.0	0.6	0	0	0	83.8	30.1
March -	5.3	0	0.3	0	3.4	0	1.7	0.7	6.1	0.5	0	0.5	0.6	2.8	67.0	18.3
April -	0	3.6	6.6	0	0	6.6	3.2	0.3	0	1.0	7.4	5.3	3.8	0	143.7	34.6
May -	4.3	5.7	0.5	0	0.3	6.0	3.4	1.5	10.0	13.2	7.9	8.5	10.3	4.6	222.1	46.1
June -	1.2	12.5	13.8	13.8	7.0	4.1	9.6	11.2	9.3	5.6	5.2	3.1	6.7	0	248.6	50.3
July -	5.8	5.7	2.7	3.7	7.5	11.0	0.8	0	2.0	3.3	2.4	8.1	7.6	4.5	177.2	35.7
August -	9.8	2.5	4.0	8.2	1.5	7.9	10.0	3.1	0.6	4.9	1.7	4.8	6.7	6.5	136.2	30.4
September -	3.1	7.8	10.0	9.8	7.5	8.8	5.8	2.9	7.2	7.4	7.6	7.7	7.2	0	170.0	45.1
October -	6.9	7.3	0	0	7.0	8.7	0	3.4	3.6	5.9	0	2.3	0	0	94.5	28.6
November -	2.8	2.4	0	0	0.6	4.4	4.4	5.4	1.9	0	0	0	0	0	42.3	16.1
December -	1.2	0	0	0	1.3	0	0	0	0.4	1.8	0	0	0	0	19.8	8.2

# MONTHLY TABLES FOR EACH HOUR OF RECORDED SUNSHINE

Local apparent time.	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9
January - -	0	0	0	0	0	1.6	5.7	10.7	10.2	9.0	8.1	2.7	0	0	0	0	0
February - -	0	0	0	0.7	5.2	9.0	12.6	13.5	12.1	11.3	9.7	8.0	1.7	0	0	0	0
March - -	0	0	0	0.7	4.8	7.7	6.1	7.4	7.9	7.2	9.0	8.5	5.6	2.1	0	0	0
April - -	0	0	2.6	5.9	10.4	13.8	14.4	15.2	14.3	12.8	13.2	14.3	13.9	10.6	2.3	0	0
May - -	0.5	8.8	14.3	16.6	18.0	18.3	17.2	17.3	17.0	16.4	18.5	16.3	15.4	14.0	11.5	2.0	0
June - -	1.9	10.2	13.9	14.9	15.3	17.1	20.5	18.9	19.1	19.2	18.8	19.0	18.4	16.5	15.9	9.0	0
July - -	0.2	4.4	9.1	12.0	14.4	14.0	14.4	14.8	14.8	14.0	14.4	15.1	14.2	13.0	7.4	1.0	0
August - -	0	0.5	4.3	6.7	10.7	9.0	11.0	12.1	14.6	15.0	14.0	13.9	12.7	9.7	2.0	0	0
September - -	0	0	1.5	6.0	13.7	16.3	19.9	21.7	21.5	19.0	18.3	15.4	10.8	5.9	0	0	0
October - -	0	0	0	1.7	8.1	9.9	10.0	12.4	13.3	12.6	11.6	10.7	8.9	0.3	0	0	0
November - -	0	0	0	0	1.0	2.1	5.0	7.6	8.3	7.1	6.6	3.9	0.7	0	0	0	0
December - -	0	0	0	0	0	1.0	3.7	4.4	3.6	4.3	2.6	0.2	0	0	0	0	0
Total - -	2.6	23.9	45.7	65.2	103.2	123.9	145.5	155.5	155.5	147.0	145.5	128.0	97.3	72.1	39.1	12.0	0



## OBSERVATIONS OF UPPER CLOUDS (CIRRUS.)

Date. 1895	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction	V'locity (0—6).	Direction.	Force (0—12).	
January 20	9am	E b S	2	NE	2	NE
February 26	8am	NW	3	W b S	2	W
" 27	10am	N	2	NNW	2	NW
March 1	8-30am	W b N	2	W	4	W
" 4	11 30am	N	3	N	4	NE b N
" 9	10am	N b W	2	NE b E	1	ENE
" 12	9am	SW	3	NNE	1	
" 18	2pm	NE b E	2	W b S	4	WSW
" 21	6pm	SE b E	2	W b S	4	WSW
" 22	9am	SE	2	W b S	1	W
" 27	12-30pm	SW	2	E b S	3	W
April 2	3-50pm	SW	2	ENE	2	NE
" 9	5-30pm	SW	2	WSW	1	W
" 10	3-10pm	S	3	WSW	5	WSW
" 14	9-10am	NW	1	NE	2	NW
" 19	4pm	NW b W	2	W b S	2	SW
" 23	4-50pm	SW	2	WSW	3	W
" 24	5pm	S b E	3	S b E	5	SE
" 30	10am	WNW	2	SW	2	SW
May 2	11-30am	NW	2	W	2	NW
" 3	9-10am	NW	3	E	1	
" 4	6-45pm	N	1	ESE	1	NW
" 5	9-45am	N b W	1	NE	1	
" 7	4pm	ENE	2	E	3	
" 8	9am	ENE	2	NE	2	NE
" 15	Noon	NW	2	WNW	5	W
" 31	2pm	NW	2	S	5	S
June 8	9-10am	W	2	SW b W	1	W
" 9	8-30am	S	2	WSW	1	W
" 10	7-30am	S	3	WNW	1	W
" 12	10am	W	2	NW b N	2	NW
" 16	Noon	W	3	W b S	2	SW
" 18	5-30pm	SSW	2	W b N	1	W
" 19	2pm	S	2	WSW	2	W
" 20	5-30pm	W b N	2	W	2	SW
" 21	2pm	NW	3	WSW	2	W
" 24	5-45pm	WNW	2	SW	2	SW
" 25	5-30pm	W b N	2	NW b W	1	NW
" 26	7-30am	S b E	2	N	1	

OBSERVATIONS OF UPPER CLOUDS (*Continued*).

Date. 1895.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	V'locity (0—6).	Direction.	Force (0—12).	
July 5	9am	NNW	2	W b S	1	W
" 5	2-50pm	NW	3	WNW	3	W
" 8	12-30 pm	S	3	S b W	4	S b W
" 9	8am	SW b W	2	SW	1	SW b S
" 10	Noon	SW	3	W	3	WNW
August 2	2pm	SSE	2	WSW	3	W
" 8	Noon	SW	2	SW	1	SW
" 12	5pm	NW	2	SW	3	SW
" 17	7-30pm	W b S	2	SW b W	0	SW
" 18	4pm	S	3	S	2	SW b S
" 31	8am	SW	3	W b S	3	SW b S
Sept. 1	8-30am	S	3	SW b W	1	
" 4	11-30 am	NE	3	SW	3	SW
" 6	7-30am	SW	3	NE	0	W
" 8	9-15am	W	2	SW	1	SW
" 13	7-30am	NW	3	WNW	1	NW
" 19	7-30am	SW	2	NW b W	0	SW
" 24	10-20am	SW b S	3	ESE	0	S
Oct. 5	9am	ENE	3	SW b S	2	SW
" 7	8-45am	WNW	2	SW	2	W
" 16	3-30pm	W	3	N	1	NE
Nov. 7	9am	W	3	W b S	1	
" 11	3pm	SW b W	2	SW b S	1	SW
" 13	9-20am	NW	2	W	5	W
" 18	1-45pm	SW	3	S	1	
" 19	1-40pm	SE	3	E b S	3	NE
" 22	2pm	SW	3	WNW	2	W
Dec. 1	1pm	NE	2	WSW	3	SW
" 2	9-30am	NE	2	WSW	1	SW
" 13	2pm	NNW	3	NW b W	7	W

# MONTHLY MAGNETICAL OBSERVATIONS

## TAKEN AT THE

### COLLEGE OBSERVATORY, STONYHURST, 1895.

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THE Horizontal, Vertical, and Total Forces are calculated to English measure; one foot, one second of mean solar time, and one grain being assumed as the units of space, of time, and of mass.

The Vertical and Total Forces are obtained from the absolute measures of the Horizontal Force, and of the Dip.

In the observations of Deflection and Vibration, taken each month for absolute measure of Horizontal Force, the same magnet has always been employed.

The moment of inertia of the magnet with its stirrup, for different degrees of temperature, and the co-efficients in the corrections required for the effects of temperature and of terrestrial magnetic induction on the magnetic moment of the magnet, were determined at the Kew Observatory by the late Mr. Welsh.

The moment of inertia of the magnet with its stirrup, using the grain and foot as the units of mass and of linear measure is 5.27303. Its rate of increase for increase of temperature is 0.00073 for every 10° of Fahr.

The weight of the magnet with its stirrup is approximately 825 grains, and the length of the magnet is nearly 3.94 inches. The moment of inertia was determined, independently of the weight and dimensions, by the method of vibration, with and without a known increase of the moment of inertia.

The temperature corrections have been obtained from the formula  $q(t^\circ - 32^\circ) + q'(t^\circ - 32^\circ)^2$ , where  $t^\circ$  is the observed temperature and 32° Fahr. the adopted standard temperature. The values of the co-efficient  $q$  and  $q'$  are respectively 0.0001128 and 0.000000436

The induction co-efficient  $\mu$  is 0.000244.

The correction for error of graduation of the Deflection bar at 1·0 foot is  $+ 0\cdot00004$  ft. at 1·3  $+ 0\cdot000064$  ft.

The observed times of vibration are entered in the Table without corrections.

The time of one vibration has been obtained each month from the mean of twelve determinations of the time of 100 vibrations.

The angles of deflection are each the mean of two sets or readings.

In deducing from these observations the ratio and product of the magnetic moment  $m$  of the magnet, and the earth's horizontal magnetic intensity  $X$ , the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread ; but no correction has been required for the rate of the chronometer, or for the arc of vibration, the former having been always under 1·5s and the latter never over 50'.

The average deflection of the magnet caused by a twist of the torsion circle through  $90^\circ$  has been about  $9'\cdot7$  of arc.

In the calculations of the ratio— $\frac{m}{X}$ , the third and subsequent terms of the series  $1 + \frac{P}{r^2} + \frac{Q}{r^4} + \&c.$ , have always been omitted.

The value of the constant  $P$  was found to be— $0\cdot00369$ .

The Declination observations have been taken once a week

## OBSERVATIONS OF DECLINATION AND DIP.

1895	G.M.T.	WEST DECLINATION		MAGNETIC DIP.		
MONTH	CIVIL DAY	Observations.	Monthly Mean.	Needle	DIP.	G.M.T. CIVIL DAY
	D. H. M.	° ' "	° ' "		° ' "	D. H. M.
Jan.	7 16 0	18 39.3	18 37.7	1 3	68 59.8 69 9.2	23 11 5 ,, 11 40
	14 15 55	18 37.8				
	21 16 0	18 39.0				
	28 16 0	18 34.7				
Feb.	4 16 5	18 40.1	18 39.9	1 3	68 55.4 69 8.3	19 16 0 ,, 16 32
	11 15 55	18 37.6				
	18 15 45	18 41.8				
	25 16 0	18 40.3				
March	4 16 15	18 41.2	18 39.0	1 3	68 59.9 69 5.7	13 16 0 ,, 16 30
	11 15 50	18 40.5				
	18 16 30	18 35.4				
April	1 16 0	18 40.0	18 40.3	1 3	68 51.2 69 4.0	16 12 50 ,, 13 18
	8 16 5	18 41.1				
	15 16 10	18 37.9				
	22 16 5	18 41.4				
	29 16 5	18 40.9				
May	6 15 45	18 38.8	18 38.5	1 3	68 51.7 69 5.5	16 12 38 ,, 13 5
	13 16 0	18 38.7				
	20 15 45	18 38.6				
	27 16 0	18 37.9				
June	17 16 10	18 39.8	18 39.2	1 3	68 56.9 69 2.2	18 10 55 ,, 11 38
	24 16 10	18 38.6				
July	1 16 5	18 39.9	18 40.4	1 3	68 57.0 69 0.5	16 16 3 ,, 16 33
	8 16 10	18 41.4				
	15 16 8	18 40.8				
	29 15 10	18 39.3				



## OBSERVATIONS OF DECLINATION AND DIP.

*(Continued.)*

1895 MONTH	G.M.T. CIVIL DAY	WEST DECLINATION		Needle	MAGNETIC DIP.	
		Observations.	Monthly Mean.		DIP.	G.M.T. CIVIL DAY
	D. H. M.	° ' ,	° ' ,		° ' ,	D. H. M.
Aug.	5 16 20	18 38·4	18 36·7	1 3	68 56·9 69 10·0	16 14 30 ,, 16 52
	12 15 50	18 35·3				
	19 17 50	18 34·3				
	26 16 10	18 38·6				
Sept.	2 16 10	18 35·9	18 35·1	1 3	68 52·1 68 56·5	25 16 55 ,, 17 40
	9 16 15	18 32·5				
	30 16 10	18 36·8				
Oct.	7 16 10	18 34·1	18 36·1	1 3	68 59·7 69 2·6	16 15 48 ,, 16 13
	14 16 5	18 34·9				
	22 15 45	18 35·0				
	28 16 10	18 40·5				
Nov.	4 15 46	18 43·8	18 37·7	1 3	68 50·1 68 59·3	15 9 30 ,, 10 3
	11 16 10	18 35·0				
	25 16 10	18 34·3				
Dec.	2 15 45	18 34·0	18 33·5	1 3	68 47·5 68 57·0	20 10 35 ,, 11 10
	9 16 15	18 35·8				
	16 15 55	18 34·7				
	23 16 15	18 32·3				
	30 16 0	18 30·6				
Yearly Mean.			18 37·8		68 59·2	

**OBSERVATIONS OF VIBRATIONS AND DEFLECTIONS  
FOR ABSOLUTE MEASURE OF MAGNETIC FORCE.**

1895 Month.	G. M. T. (Civil Day).	Temp.	Time of one vibration	G. M. T.	Temp.	Observed Deflection at 1.0 ft. at 1.3 ft.	Value of m
	D. H. M.	°		D. H. M.	°	° '	
Jan.	21 9 42	36.7	5.9773	21 {11 3 11 6	43.8 43.6	12 2.3 5 27.1	0.39004
Feb.	19 9 40	34.4	5.9730	19 {10 59 11 1	38.0 37.6	12 3.8 5 28.2	0.39041
Mar.	13 10 37	46.9	5.9820	13 {11 56 11 59	48.7 49.0	12 5.5 5 28.7	0.39100
Apr.	16 9 51	48.5	5.9766	16 {11 55 11 55	53.4 53.2	12 4.0 5 29.0	0.39115
May	16 9 22	47.7	5.9685	16 {10 33 10 27	50.0 50.0	12 6.4 5 31.5	0.39222
June	17 10 56	56.3	5.9774	17 {12 3 12 10	58.5 58.4	12 1.3 5 26.6	0.39062
July	16 10 22	59.0	5.9863	16 {11 28 11 26	59.0 59.0	12 2.8 5 27.3	0.39050
Aug.	16 9 56	60.5	5.9843	16 {10 58 10 58	63.6 63.7	11 59.6 5 25.9	0.38997
Sept.	25 11 0	66.7	5.9936	25 {12 9 12 13	69.2 69.4	11 58.9 5 25.8	0.38963
Oct.	16 10 18	56.3	5.9931	16 {11 18 11 18	57.6 58.0	11 59.9 5 26.4	0.38925
Nov.	14 10 35	51.5	5.9856	14 {11 32 11 31	52.5 52.5	12 0.3 5 26.2	0.38951
Dec	19 9 54	37.4	5.9726	19 {10 45 10 46	38.0 38.0	12 2.4 5 27.2	0.39014

## MAGNETIC INTENSITY.

BRITISH UNITS.				C. G. S. UNITS.		
1895	Horizon- tal force.	Vertical force.	Total Force.	Horizontal Force.	Vertical Force.	Total Force.
Jan. ..	3·7223	9·7349	10·4223	0·1716	0·4489	0·4806
Feb. ..	3·7203	9·7074	10·3959	0·1715	0·4476	0·4793
Mar. ..	3·7117	9·6926	10·3789	0·1711	0·4469	0·4786
April ..	3·7153	9·6583	10·3481	0·1713	0·4453	0·4771
May ..	3·7112	9·6559	10·3446	0·1711	0·4452	0·4770
June ..	3·7245	9·6987	10·3892	0·1717	0·4472	0·4790
July ..	3·7151	9·6677	10·3570	0·1713	0·4458	0·4775
Aug. ..	3·7232	9·7282	10·4163	0·1717	0·4485	0·4803
Sept. ..	3·7196	9·6419	10·3346	0·1715	0·4446	0·4765
Oct. ..	3·7176	9·6940	10·3823	0·1714	0·4470	0·4787
Nov. ..	3·7222	9·6519	10·3448	0·1716	0·4450	0·4770
Dec. ..	3·7256	9·6406	10·3355	0·1718	0·4445	0·4766
Means	3·7191	9·6810	10·3708	0·1715	0·4464	0·4782

# HORIZONTAL MAGNETIC DIRECTION.

Horizontal Magnetic Direction from daily measures of the continuous Curves West of N

	Mean of the highest daily readings. (a)	Mean of the lowest daily readings (b)	Means of a and b. (c)	Means of daily readings at 4 a.m. & 4 p.m. (d)	Difference c-d.	Difference of a and b, or Mean daily range.	Highest Reading of the Month.	Lowest reading of the month.
1895.	18° +							18° +
January	45.5	30.9	38.2	40.5	+ 2.3	14.6	51.2	6.2
February	47.3	29.2	38.8	40.5	+ 2.2	18.1	63.7	10.7
March	48.0	29.2	38.6	39.5	+ 0.9	18.8	55.7	10.2
April	47.0	28.7	37.9	38.5	+ 0.6	18.3	55.2	11.2
May	44.6	27.2	35.9	36.0	+ 0.1	17.4	53.7	19.2
June	43.2	25.4	34.3	35.6	+ 1.3	17.8	46.2	18.7
July	42.3	25.4	33.9	35.0	+ 1.1	16.9	47.7	14.7
August	41.5	27.1	34.3	33.9	- 0.4	14.4	45.2	18.7
September	41.3	25.1	33.2	33.2	0.0	16.2	48.7	15.2
October	41.0	22.1	31.6	33.2	+ 1.6	18.9	48.7	6.7
November	37.6	21.6	29.6	32.5	+ 2.9	16.0	45.7	1.2
December	36.8	24.5	30.7	32.1	+ 1.4	12.8	46.2	8.2
Means	48.0	26.4	34.7	35.9	+ 1.2	16.6	50.9	11.7
Correction for diurnal range				- 3				
Mean for the year				18° 35' 6				

# HORIZONTAL MAGNETIC FORCE.

Horizontal Magnetic Force in C. G. S. units from daily measures of the Continuous Curves.

The Figures in the columns are entered to the unit  $10^{-5}$  C. G. S.

1895.	Mean of the highest daily readings. (a)	Mean of the lowest daily readings. (b)	Means of a and b. (c)	Means of daily readings 4a.m. & 4p.m. (d)	Differ- ences d-c	Differences of a and b or Mean daily Range.	Highest reading of the Month.	Lowest reading of the Month.	Monthly Range.
	17000 +				0 +		17000 +		0 +
January -	192	140	166	172	6	52	211	66	145
February -	202	133	168	170	2	69	236	19	217
March -	210	126	168	175	7	84	236	81	155
April -	208	121	165	174	9	87	256	66	190
May -	215	125	170	171	1	90	284	101	188
June -	210	114	162	169	7	96	264	76	188
July -	200	112	156	164	8	88	259	66	193
August -	184	117	151	160	9	67	241	56	185
September -	174	104	139	146	7	70	226	41	185
October -	201	122	162	164	2	79	203	53	150
November -	214	144	179	182	3	70	260	55	205
December -	214	157	186	185	-1	57	275	95	180
Means -	202	126	164	169	5	76	246	65	181
Correction for diurnal range				-4					
Mean Horizontal Force for the year 0.17165 C.G.S. unit.									



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Recent values of the Magnetic Elements by Charles Chree, Sc.D.	Kew Observatory
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<b>Bollettino Mensuale dell oss Central del R. Coll. Carlo Alberto in Moncalieri 1894-5</b>	<b>Osservatorio</b>

APPENDIX

RESULTS

OF

METEOROLOGICAL OBSERVATIONS

TAKEN AT

ST. IGNATIUS' COLLEGE, MALTA

BY THE

REV. J. F. DOBSON, S.J.

1895

# ST. IGNATIUS' COLLEGE, MALTA.

Lat 35° 55' N.      Long. 14° 29' E.      Barometer Readings.  
reduced to 32° F. at sea level.

## METEOROLOGICAL REPORT.

JANUARY, 1895.

Result of Observations taken during the Month.		Mean for the last 12 years
Mean Reading of the Barometer....inches	29·906	30·041
Highest                   ,,                   on the 20th                   ,,	30·342	30·413
Lowest                   ,,                   on the 1st                   ,,	29·396	29·572
Range of Barometer Readings .....	0·946	0·841
Highest Reading of a Max. Therm. on the 17th	67·5	64·8
Lowest Reading of a Min. Therm. on the 30th	39·3	41·6
Range of Thermometer Readings .....	28·2	23·2
Greatest Range in 24 hours on the 16th .....	18·7	18·4
Mean of all the Highest Readings .....	60·2	58·9
Mean of all the Lowest Readings .....	48·3	48·3
Mean Daily Range ..	11·9	10·6
Mean Temperature (deduced from Max. & Min.)	53·6	52·9
Mean Temperature (deduced from Dry Bulb)	52·9	52·7
Adopted Mean Temperature.....	53·3	52·8
Mean Temperature of Evaporation.....	48·3	48·5
Mean Temperature of Dew Point .....	44·9	45·5
Mean elastic force of Vapour .....inches	0·298	0·305
Mean weight of Vapour in a cub. ft. of air grains	3·3	3·5
Mean additional weight required for saturation ,,	0·9	0·9
Mean degree of Humidity .....	79	80
Mean weight of a cubic foot of air ....grains	539·7	542·4
Fall of Rain .....	1·907	3·881
Number of days on which Rain fell .....	10	14
Mean amount of Cloud (an overcast sky=10)..	5·7	5·2
Total number of miles of Wind indicated ....	9767	8269
Mean Velocity of Wind per hour .....miles	13·1	11·1



## FEBRUARY, 1895.

Results of Observations taken during the Month.		Mean for the last 12 years.
Mean Reading of the Barometer .....	inches 29·870	30·032
Highest	„ on the 1st „ 30·119	30·333
Lowest	„ on the 17th „ 29·435	29·646
Range of Barometer Readings.....	„ 0·684	0·687
Highest Reading of a Max. Therm. on the 27th	70·5	67·0
Lowest Reading of a Min. Therm. on the 19th	34·2	41·8
Range of Thermometer Readings .....	36·3	25·2
Greatest Range in 24 hours on the 20th .....	20·1	19·3
Mean of all the Highest Readings .....	62·0	60·1
Mean of all the Lowest Readings.....	50·3	49·0
Mean Daily Range .....	11·7	11·1
Mean Temperature (deduced from Max & Min)	55·2	53·5
Mean Temperature (deduced from Dry Bulb)	55·3	53·8
Adopted Mean Temperature.....	55·3	53·7
Mean Temperature of Evaporation.....	50·7	49·5
Mean Temperature of Dew Point.....	47·6	46·6
Mean elastic force of Vapour .....	inches 0·330	0·319
Mean weight of Vapour in a cub.ft.of air grains	3·7	3·6
Mean additional weight required for saturation,,	0·9	0·8
Mean degree of Humidity .....	80	82
Mean weight of a cubic foot of air ....	grains 536·7	540·9
Fall of Rain .....	inches 1·076	2·253
Number of days on which Rain fell.....	9	9
Mean amount of Cloud (an overcast sky=10)	6·7	4·8
Total number of miles of Wind indicated ....	8576	7865
Mean Velocity of Wind per hour .....	miles 12·8	11·6

## MARCH, 1895.

Results of Observations taken during the Month.		Mean for the last 12 years
Mean Reading of the Barometer.....inches	29.992	29.995
Highest                   ,,                   on the 24th   ,,	30.233	30.361
Lowest                   ,,                   on the 12th   ,,	29.513	29.528
Range of Barometer Readings .....	0.720	0.833
Highest Reading of a Max. Therm. on the 30th	81.6	73.4
Lowest Reading of a Min. Therm. on the 20th	41.8	42.9
Range of Thermometer Readings .....	39.8	30.5
Greatest Range in 24 hours on the 30th .....	25.4	22.6
Mean of all the Highest Readings .....	63.9	63.1
Mean of all the Lowest Readings.....	49.4	50.8
Mean Daily Range .....	14.5	12.3
Mean Temperature (deduced from Max. & Min.)	56.0	56.1
Mean Temperature (deduced from Dry Bulb)	53.9	55.3
Adopted Mean Temperature.....	55.0	55.7
Mean Temperature of Evaporation.....	50.7	51.6
Mean Temperature of Dew Point .....	47.3	48.4
Mean elastic force of Vapour.....inches	0.327	0.341
Mean weight of Vapour in a cub. ft. of air grains	3.7	3.8
Mean additional weight required for saturation,,	1.1	1.1
Mean degree of Humidity .....	76	79
Mean weight of a cubic foot of air ....grains	537.1	537.4
Fall of rain .....	0.803	1.060
Number of Days on which rain fell .....	9	7
Mean amount of Cloud (an overcast sky=10)	4.5	4.5
Total number of miles of Wind indicated.....	8800	8020
Mean Velocity of Wind per hour .....	11.8	10.7

## APRIL, 1895.

Results of Observations taken during the Month.	Mean for the last 12 years.
Mean Reading of the Barometer.....inches 29·971	29·939
Highest                   ,,           on the 11th   ,,   30·138	30·264
Lowest                   ,,           on the 1st   ,,   29·657	29·523
Range of Barometer Readings.....,,   0·481	0·741
Highest Reading of a Max. Therm. on the 17th 80·4	76·8
Lowest Reading of a Min. Therm. on the 2nd 51·3	47·8
Range of Thermometer Readings..... 29·1	29·0
Greatest Range in 24 hours on the 27th ..... 22·1	21·9
Mean of all the Highest Readings ..... 70·3	67·3
Mean of all the Lowest Readings..... 56·5	54·1
Mean Daily Range ..... 13·8	13·2
Mean Temperature (deduced from Max. & Min.) 62·4	59·8
Mean Temperature (deduced from Dry Bulb) 61·7	59·5
Adopted Mean Temperature..... 62·0	59·7
Mean Temperature of Evaporation ..... 57·6	55·6
Mean Temperature of Dew Point ..... 54·0	52·3
Mean elastic force of Vapour.....inches 0·418	0·392
Mean weight of Vapour in a cub.ft. of air grains 4·6	4·4
Mean additional weight required for saturation., 1·5	1·3
Mean degree of Humidity ..... 77	78
Mean weight of a cubic foot of air ....grains 531·1	531·4
Fall of Rain .....inches 0·115	0·787
Number of Days on which rain fell..... 2	6
Mean amount of Cloud (an overcast sky=10).. 4·9	4·4
Total number of miles of Wind indicated .... 7609	8285
Mean Velocity of Wind per hour .....miles 10·6	11·5

## MAY, 1895.

Results of Observations taken during the Month		Mean for the last 12 years.
Mean Reading of the Barometer.....inches	30·024	29·988
Highest                   ,,                   on the 2nd   ,,	30·335	30·172
Lowest                   ,,                   on the 17th   ,,	29·654	29·623
Range of Barometer Readings.....   ,,	0·681	0·549
Highest Reading of a Max. Therm. on the 24th	81·6	82·1
Lowest Reading of a Min. Therm. on the 9th	53·1	53·6
Range of Thermometer Readings .....	28·5	28·5
Greatest Range in 24 hours on the 3rd.....	22·1	23·7
Mean of all the Highest Readings.....	72·7	72·7
Mean of all the Lowest Readings .....	59·3	58·5
Mean Daily Range..... ..	13·4	14·2
Mean Temperature(deduced from Max.& Min)	65·0	64·4
Mean Temperature (deduced from Dry Bulb)	64·8	63·9
Adopted Mean Temperature .....	64·9	64·2
Mean Temperature of Evaporation .....	60·9	60·1
Mean Temperature of Dew Point .....	57·2	56·6
Mean elastic force of Vapour ..... inches	0·469	0·459
Mean weight of Vapour in a cubic ft. of air grains	5·2	5·0
Mean additional weight required for saturation,,	1·7	1·7
Mean degree of Humidity.....	75	76
Mean weight of a cubic foot of air.... grains	526·8	526·8
Fall of Rain.....inches	0·506	0·648
Number of days on which Rain fell.....	3	3
Mean amount of Cloud (an overcast sky=10)	5·8	3·7
Total number of miles of Wind indicated ..	6636	7362
Mean Velocity of Wind per hour..... miles	8·9	9·9

## JUNE, 1895.

Results of Observations taken during the Month.	Mean for the last 12 years.
Mean Reading of the Barometer .....inches 30 038	30·013
Highest                   "                   on the 23rd ,, 30·220	30·177
Lowest                   "                   on the 11th ,, 29·795	29·819
Range of Barometer Readings..... ,, 0·425	0·358
Highest Reading of a Max. Therm. on the 29th 88·1	90·5
Lowest Reading of a Min. Therm. on the 1st 57·1	58·9
Range of Thermometer Readings ..... 31·0	31·6
Greatest Range in 24 hours on the 29th .... 23·1	25·4
Mean of all the Highest Readings ..... 79·2	80·5
Mean of all the Lowest Readings ..... 65·1	64·6
Mean Daily Range ..... 14·1	15 9
Mean Temperature (deduced from Max. & Min) 71·5	71·8
Mean Temperature (deduced from Dry Bulb) 70·6	71·1
Adopted Mean Temperature ... .. 71·0	71·5
Mean Temperature of Evaporation ..... 66·3	65·9
Mean Temperature of Dew Point ..... 62·7	61·6
Mean elastic force of Vapour ..... inches 0·570	0·549
Mean weight of Vapour in a cub. ft. of air grains 6·2	5·9
Mean additional weight required for saturation,, 2·1	2·4
Mean degree of Humidity ..... 75	71
Mean weight of a cubic foot of air .....grains 520·7	519·7
Fall of Rain .....inches 0·000	0·080
Number of days on which Rain fell ..... 0	1
Mean amount of Cloud (an overcast sky=10) 3·2	2·0
Total number of miles of Wind indicated.... 7453	6181
Mean Velocity of Wind per hour .....miles 10·4	8 6

## JULY, 1895.

Results of Observations taken during the Month.		Mean for the last 12 years
Mean Reading of the Barometer .....inches	30·012	30·006
Highest                   ,,                   on the 3rd... ,,	30·105	30·149
Lowest                   ,,                   on the 19th... ,,	29·818	29·835
Range of Barometer Readings ..... ,,	0·287	0·314
Highest Reading of a Max. Therm. on the 5th	103·6	97·0
Lowest Reading of a Min. Therm. on the 11th ...	64·6	64·7
Range of Thermometer Readings .....	39·0	32·3
Greatest Range in 24 hours on the 5th.....	31·9	26·5
Mean of all the Highest Readings.....	87·7	86·9
Mean of all the Lowest Readings.....	69·7	69·8
Mean Daily Range .....	18·0	17·1
Mean Temperature (deduced from Max. & Min)	78·2	77·8
Mean Temperature (deduced from Dry Bulb)	78·9	76·8
Adopted Mean Temperature .....	78·6	77·3
Mean Temperature of Evaporation .....	70·8	70·4
Mean Temperature of Dew Point.....	68·0	65·6
Mean elastic force of Vapour .....inches	0·684	0·631
Mean weight of Vapour in a cub. ft. of air grains	6·6	6·8
Mean additional weight required for saturation,,	4·1	3·3
Mean degree of Humidity .....	61	67
Mean weight of a cubic foot of air .....grains	511·4	513·6
Fall of Rain .....inches	0·0	0·037
Number of days on which Rain fell.....	0	.....
Mean amount of Cloud (an overcast sky=10)	1·2	0·8
Total number of miles of Wind indicated.....	5021	5556
Mean Velocity of Wind per hour .....miles	6·8	7·5

## AUGUST, 1895.

Results of Observations taken during the Month		Mean for the last 12 years.
Mean Reading of the Barometer . . . . . inches	30·021	30·013
Highest                   ,,                   on the 28th .. ,,	30·221	30·159
Lowest                   ,,                   on the 4th.... ,,	29·862	29·859
Range of Barometer Readings . . . . .	0·359	0·300
Highest Reading of a Max. Therm. on the 1st	91·9	96·7
Lowest Reading of a Min. Therm. on the 26th	61·4	66·1
Range of Thermometer Readings . . . . .	30·5	30·6
Greatest Range in 24 hours on the 26th ... ..	28·8	25·8
Mean of all the Highest Readings.....	87·1	87·2
Mean of all the Lowest Readings . . . . .	68·8	70·9
Mean Daily Range . . . . .	18·3	16·3
Mean Temperature (deduced from Max.& Min.)	77·2	78·3
Mean Temperature (deduced from Dry Bulb)	77·9	78·2
Adopted Mean Temperature ..... ..	77·6	78·2
Mean Temperature of Evaporation . . . . .	71·9	71·4
Mean Temperature of Dew Point.....	67·6	66·7
Mean elastic force of Vapour ... ..inches	0·675	0·654
Mean weight of Vapour in a cub. ft. of air grains	7·2	6·9
Mean additional weight required for saturation ,,	3·0	3·4
Mean degree of Humidity . . . . .	70	67
Mean weight of a cubic foot of air .....grains	512·4	512·3
Fall of Rain .. ..inches	0·370	0·089
Number of days on which Rain fell.....	1	1
Mean amount of Cloud (an overcast sky=10)	1·7	1·0
Total number of miles of Wind indicated ....	4708	5397
Mean Velocity of Wind per hour... ..miles	6·3	7·2

R, 1895.

ing the Month.

Mean for the last 12 years.
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## OCTOBER, 1895.

Results of Observations taken during the Month.	Mean for the last 12 years.
Mean Reading of the Barometer .....inches 29·997	30·051
Highest                   ,,                   on the 1st   ,,   30·247	30·263
Lowest                   ,,                   on the 20th   ,,   29·654	29·751
Range of Barometer Readings.....,   0·593	0·512
Highest Reading of a Max. Therm. on the 27th 90·8	87·9
Lowest Reading of a Min. Therm. on the 20th 53·3	56·1
Range of Thermometer Readings..... 37·5	31·8
Greatest Range in 24 hours on the 1st..... 22·1	19·8
Mean of all the Highest Readings..... 80·0	76·7
Mean of all the Lowest Readings ..... 65·9	64·7
Mean Daily Range ..... 14·1	12·0
Mean Temperature (deduced from Max.& Min.) 72·0	69·8
Mean Temperature (deduced from Dry Bulb) 69·9	68·9
Adopted Mean Temperature ..... 71·0	69·5
Mean Temperature of Evaporation ..... 65·2	64·6
Mean Temperature of Dew Point..... 61·4	61·1
Mean elastic force of Vapour .....inches 0·545	0·543
Mean weight of Vapour in a cub. ft. of air grains 6·1	5·9
Mean additional weight required for saturation ,, 1·8	1·8
Mean degree of Humidity ..... 75	76
Mean weight of a cubic foot of air.....grains 522·5	523·1
Fall of Rain .....inches 1·173	2·921
Number of days on which Rain fell..... 6	7
Mean amount of Cloud (an overcast sky=10) 4·5	4·1
Total number of miles of Wind indicated .... 7389	6630
Mean Velocity of Wind per hour .....miles 9·9	9·0

R, 1895.

ing the month.	Mean for the last 19 years.
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## DECEMBER, 1895.

Results of Observations taken during the Month.	Mean for the last 12 years
Mean Reading of the Barometer ....inches 29·970	30·047
Highest                   ,,                   on the 10th ,, 30·327	30·389
Lowest                   ,,                   on the 14th ,, 29·706	29·569
Range of Barometer Readings                   0·621	0·820
Highest Reading of a Max. Therm.on the 19th 69·9	68·6
Lowest Reading of a Min. Therm. on the 31st 44·2	43·7
Range of Thermometer Readings                   25·7	24·9
Greatest Range in 24 hours on the 11th ..... 18 6	17·3
Mean of all the Highest Readings                   61·2	61·9
Mean of all the Lowest Readings                   53·4	52·2
Mean Daily Range                   7 8	9·7
Mean Temperature (deduced from Max & Min.) 56·6	56·4
Mean Temperature (deduced from Dry Bulb) 57·3	56·0
Adopted Mean Temperature                   56·9	56·2
Mean Temperature of Evaporation..... 52·5	51·8
Mean Temperature of Dew Point                   48·7	48·6
Mean elastic force of Vapour                   inches 0·344	0·342
Mean weight of Vapour in a cub. ft. of air grains 3·9	3·9
Mean additional weight required for saturation,, 1·2	1·1
Mean degree of Humidity                   76	79
Mean weight of a cubic foot of air ....grains 535·4	538·6
Fall of Rain                   inches 3·518	4·266
Number of days on which Rain fell                   15	15
Mean amount of Cloud (an overcast sky = 10) .. 6·9	5·7
Total number of miles of Wind indicated.... 9039	8205
Mean Velocity of Wind per hour                   miles 12·2	11·1

## Summary of Observations FOR 1895.

Results of Observations taken during the Year.		Mean for the last 12 years.
Mean Reading of the Barometer ....inches	30·008	30·024
Highest ,, on November 7th	30·447	30·489
Lowest ,, on January 1st	29·396	29·370
Range of Barometer Readings .....	1·051	1·119
Highest Reading of a Max. Therm. on July 5th	103·6	99·0
Lowest Reading of a Min. Therm. on Feb. 19th	34·2	40·8
Range of Thermometer Readings .....	69·4	58·2
Greatest Range in 24 hours on July 5th .....	31·9	28·5
Mean of all the Highest Readings .....	73·5	72·5
Mean of all the Lowest Readings.....	59·6	59·3
Mean Daily Range .....	13·9	13·2
Mean Temperature (deduced from Max. & Min.)	65·7	65·0
Mean Temperature (deduced from dry bulb)..	65·2	64·4
Adopted Mean Temperature .....	65·5	64·7
Mean Temperature of Evaporation .....	60·4	59·8
Mean Temperature of Dew Point.....	57·2	56·1
Mean elastic force of Vapour .....inches	0·480	0·453
Mean weight of Vapour in a cub. ft. of air grains	5·2	5·1
Mean additional weight required for saturation ,,	1·9	1·8
Mean degree of Humidity .....	75	76
Mean weight of a cubic foot of air ....grains	526·8	527·9
Fall of rain .....	inches 11·384	20·207
Number of days on which rain fell .....	67	77
Mean amount of Cloud (an overcast sky=10)	4·5	3·6
Total number of miles of wind indicated ....	84755	83924
Mean Velocity of Wind per hour.....miles	9·7	9·6

SINCE MAY, 1883.

The Maximum monthly mean height of the Barometer was  
in November, 1889, and was .....inches 30·249

The Minimum ,, ,, in January, 1886, and was 29·844

The Maximum yearly mean height of the Barometer was in 1884, and was .....	inches	30·057
The Minimum ,, ,, in 1890, and was .....		29·996
The greatest monthly range of the Barometer was in January, 1886, and was.....		1·201
The least ,, ,, in August, 1883, and was .....		0·188
The highest reading of the Barometer was on January 26th, 1887, and was .....		30·627
The lowest ,, ,, on January 17th, 1886, and was		29·155
Extreme range .....		1·472
The highest temperature was on July 20th, 1889, and was..		104·1
The lowest ,, ,, February 19th, 1895.....		34·2
The highest mean temperature of a month was in August, 1885, and was .....		83·2
The lowest ,, ,, ,, February, 1891, ..		49·5
The greatest monthly mean weight of vapour } in a cubic foot of air .....grains }	August, 1885	7·9
The least ,, ,, January and February, 1891, and was gr		3·0
The highest observed Dew point was on August 30th, 1885, and was .....		78·7
The lowest ,, ,, February 19th, 1895, and was		27·9
The greatest fall of rain in a month, was in December, 1889, and was .....	inches	8 952
The greatest number of days on which } rain fell in one month ....days }	January, 1889 ....	24
The greatest fall of rain in a year was in 1889 and was inches		26·044
The smallest ,, ,, ,, 1895 ,, ,,		11·384
The greatest number of rainy days in a year was in 1894 and was		90
The least ,, ,, ,, 1888 ,,		59
The highest temperature registered in sunshine was on the 5th July, 1895, and was .....		159·0
The lowest temperature registered on ground was on the 19th February, 1895, and was .....		31·7
The highest observed sea temperature was on the 5th August, 1887, and was.....		85·0
The lowest ,, ,, 30th January, 1895, and was		55·5
The smallest mean amount of cloud observed in one month was in August, 1890, and was .....		0·0
The greatest ,, ,, in January, 1894, and was		7·2



## MARCH.

The Dew-point ranged between  $37.1^{\circ}$  on the 1st, and  $55.6^{\circ}$  on the 31st.

In Sunshine, the highest reading was  $132.5^{\circ}$  on the 30th.

On Ground, the lowest reading was  $36.3^{\circ}$  on the 19th.

The Sea has risen to  $61.0^{\circ}$ .

Thunderstorms passed on the 27th.

Lightning was seen on the 6th and 20th.

Hail fell on the 6th and 7th.

Total Rainfall since last June  $17.532$  inches ; the average of 10 years,  $18.072$  inches.

## APRIL.

The Dew-point ranged between  $46.7^{\circ}$  on the 10th, and  $61.7^{\circ}$  on the 26th.

In Sunshine, the highest reading was  $133.5^{\circ}$  on the 27th.

On Ground, the lowest reading was  $45.6^{\circ}$  on the 3rd.

The Sea has risen to  $65.4^{\circ}$

Lightning was seen on the 20th.

Total Rainfall since last June  $18.335$  inches ; the average of 10 years,  $18.840$  inches.

## MAY.

The Dew-point, ranged between  $50.2^{\circ}$  on the 3rd and  $64.0^{\circ}$  on the 23rd.

In Sunshine, the highest reading was  $136.6^{\circ}$  on the 3rd

On Ground, the lowest reading was  $47.4^{\circ}$  on the 9th.

The Sea has risen to  $70.0^{\circ}$ .

Thunderstorms passed on the 5th and 6th.

Lightning was seen on the 9th and 10th.

Hail fell on the 5th.

Total Rainfall since last June  $18.841$  inches ;  
the average of 10 years,  $19.601$  inches.

## JUNE.

The Dew-point ranged between  $53.3^{\circ}$  on the 14th and  $71.3^{\circ}$  on the 20th.

In Sunshine, the highest reading was  $139.9^{\circ}$  on the 29th.

On Ground, the lowest reading was  $51.1^{\circ}$  on the 1st.

The Sea has averaged to  $74^{\circ}$ .

Total Rainfall since last June 18.841 inches ; the average of 10 years 19.601 inches.

## JULY.

The Dew-point ranged between  $53.7^{\circ}$  on the 2nd, and  $74.0^{\circ}$  on the 31st.

In Sunshine, the highest reading was  $159.0^{\circ}$  on the 5th.

On Ground, the lowest reading was  $59.4^{\circ}$  on the 12th.

The Sea has risen to  $82.5^{\circ}$ .

Lightning was seen on the 6th.

## AUGUST.

The Dew-point ranged between  $73.9^{\circ}$  on the 1st, and  $62.5^{\circ}$  on the 25th.

In Sunshine the highest reading was  $144.6^{\circ}$  on the 29th.

The Sea has averaged  $80.0^{\circ}$ .

Lightning was seen on the 18th, 19th, 23rd, and 26th.

Total Rainfall since last June 0.370 inches ; the average of 12 years, 0.127 inches.

## SEPTEMBER.

The Dew-point ranged between  $72.4^{\circ}$  on the 3rd, and  $56.8^{\circ}$  on the 24th.

In Sunshine the highest reading was  $144.5^{\circ}$  on the 18th.

On Ground, the lowest reading was  $53.6^{\circ}$  on the 25th.

The Sea has fallen to  $76.2^{\circ}$ , averaging  $78.6^{\circ}$ .

Thunderstorms passed on the 18th.

Lightning was seen on the 8th, 15th, 16th, 17th, 19th, 20th.

Total Rainfall since last June 0.495 inches ; the average of 12 years, 1.292 inches.



## OCTOBER.

The Dew-point ranged between  $70.5^{\circ}$  on the 11th, and  $43.3^{\circ}$  on the 19th.

In Sunshine, the highest reading was  $135.1^{\circ}$  on the 1st.

On Ground, the lowest reading was  $47.3^{\circ}$  on the 20th.

The Sea has fallen to  $73.0^{\circ}$  averaging  $74.6^{\circ}$ .

Thunderstorms passed on the 17th and 18th.

Lightning was seen on the 13th, 19th, and 22nd.

Total Rainfall since last June, 1.668 inches ; the average of 12 years, 4.213 inches.

## NOVEMBER.

The Dew-point ranged between  $67.9^{\circ}$  on the 1st, and  $50.1^{\circ}$  on the 25th.

In Sunshine, the highest reading was  $130.1^{\circ}$  on the 11th.

On Ground, the lowest reading was  $51.1$  on the 21st.

The Sea has fallen to  $67.8^{\circ}$ , averaging  $70.4^{\circ}$ .

Thunderstorms passed on the 12th, 14th, and 19th.

Lightning was seen on the 5th, 6th, 16th, 17th, 18th, 20th, 21st, 30th.

Total Rainfall since last June 3.459 inches ; the average of 12 years, 7.631 inches

Mean temperature for the month is the highest of 12 years.  
Rain remarkably below the average.

## DECEMBER.

The Dew-point ranged between  $37.1^{\circ}$  on the 9th, and  $56.5^{\circ}$  on the 17th.

In Sunshine, the highest reading was  $115.8^{\circ}$  on the 5th.

On Ground, the lowest reading was  $38.0^{\circ}$  on the 31st.

The Sea has fallen to  $62.0^{\circ}$ , averaging  $64.9$ .

Thunderstorms passed on the 2nd, 4th, 20th, 21st.

Lightning was seen on the 1st and 15th.

Hail fell on the 9th, 21st, and 22nd.

Total Rainfall since last June, 6.977 inches ; the average of 12 years, 11.897 inches.

## NOTES FOR THE YEAR.

The Dew-point ranged between  $27.9^{\circ}$  on February 19th, and  $74.0^{\circ}$  on July 31st.

In Sunshine, the highest reading was  $159.0^{\circ}$  on July 5th.  
On Ground, the lowest reading was  $31.7^{\circ}$  on February 19th.

The Sea has ranged from  $55.5^{\circ}$  on January 30th, to  $83.0^{\circ}$  on September 3rd.

Thunderstorms passed on 16 days

Lightning was seen on 33 days.

Hail fell on 13 days.

---

## CORRIGENDA.

*In Report for August, 1894,*

*For Mean Additional Weight of Vapour required for*

saturation (Average 10 years) .. 3.3 grains

*Read* .. .. . 3.5 grains

*In Report for November, 1894,*

*For—Fall of rain* .. .. . 4.559 inches

*Read* .. .. . 4.599 inches

*In Notes for the Year, 1894, (p. 79.)*

*For—The lowest temperature was on February 20th, 1851*

*Read* .. .. . February 20th, 1891

And (p. 84.)

*For—The Sea has ranged from  $56.8^{\circ}$  on February 25th, to  $79.5^{\circ}$  on August 26th.*

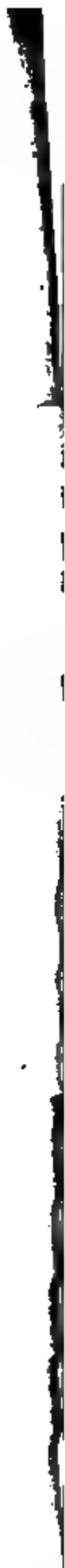
*Read—The Sea has ranged from  $56.8^{\circ}$  on February 25th, to  $81.3^{\circ}$  on July 25th.*





STONYHURST COLL  
OBSERVATORY,  
LAN

*With FATHER SIDGREAVE*  
*COMPLIMENTS.*









STONYHURST COLLEGE  
OBSERVATORY.

RESULTS

OF

METEOROLOGICAL, MAGNETICAL,

AND

SOLAR OBSERVATIONS.

BY THE

REV W. SIDGREAVES, S.J., F.R.A.S.

1896.

CLITHEROE :

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1897.



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## INTRODUCTION.

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THE work of the Meteorological and Magnetical department has been carried on as described in the Introduction 1892. The weekly reports have been sent regularly to the Meteorological Office, and the monthly report to the Registrar General. Occasional special reports have also been supplied to applications.

The continuous photographic records of Meteorological and Magnetical changes have been broken only by occasional troubles with the gas supply.

Tracings of the horizontal magnetic direction and force have been supplied to several applications, in connection with distant earthquakes ; but we have found nothing in the movements of the magnets that could be attributed to any but magnetical disturbance. Even the nearer earth tremor of December made no impression on the magnetic curves. The tremor was felt slightly but distinctly by a very few of the residents in our neighbourhood

Over 350 photographs of stellar spectra have been obtained with the compound prism spectrograph in combination with the Perry-Memorial objective. These include some trials with the small dispersion of a single half-prism of aluminium glass, in order to provide the means of learning the condition of the calcium line K, in the spectra of small stars. The length of the spectrum is too small to show a fine line ; but it distinguishes well between a broad, medium, and thin line, in stars to the 6th magnitude.

WALTER SIDGREAVES, S.J.

# Stonyhurst Observatory.

Lat 53° 50' 40"N. Long. 9m. 52s. 68. W. Height of the Barometer  
above the sea 381 ft.

## METEOROLOGICAL REPORT.

JANUARY, 1896.

Result of Observations taken during the Month.		Mean for the last 49 years
Mean Reading of the Barometer....inches	29·888	29·446
Highest „ on the 9th.. „	30·597	30·286
Lowest „ on the 15th „	28·821	28·590
Range of Barometer Readings .....	1·776	1·696
Highest Reading of a Max. Therm. on the 2nd	54·0	51·5
Lowest Reading of a Min. Therm. on the 20th	25·0	20·4
Range of Thermometer Readings .....	29·0	31·1
Mean of all the Highest Readings .....	45·3	42·2
Mean of all the Lowest Readings .....	35·1	32·4
Mean Daily Range ..	10·2	9·8
Deduced Monthly Mean (from Mean of Max. and Min.) .....	40·0	37·0
Mean Temperature from Dry Bulb.....	40·4	37·0
Adopted Mean Temperature.....	40·2	37·0
Mean Temperature of Evaporation.....	38·9	35·9
Mean Temperature of Dew Point .....	37·2	33·7
Mean elastic force of Vapour .....	0·222 in	0·195 in
Mean-weight of Vapour in a cub. ft. of air.....	2·6 gr	2·4 gr
Mean additional weight required for saturation	0·4 gr	0·4 gr
Mean degree of Humidity (saturation 1·00) ..	0·90	0·86
Mean weight of a cubic foot of air .....	554·6 gr	549·7 gr
Fall of Rain .....	3·343 in	4·098 in
Number of days on which Rain fell .....	15	19·7

## JANUARY 1896.

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	2	2	0	4	6	14	0
Mean Velocity in miles per hour	4·8	5·1	3·9	0	6·7	8·2	11·0	0
Total No. of miles for each Direction.	343	245	187	0	646	1179	3682	0

The total No. of miles registered during the month was 6282.

The max. Velocity of the wind was 48 miles per hour, W. on the 15th at 1·0 p.m.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·4

In the month of January the highest reading of the Barome-

ter during 49 years, was on the 9th, in 1896, and was.... 30·597

The lowest                   ,,                   26th, 1884                   ,,                   .... 27·803

The highest Temperature                   7th, 1887                   ,,                   .... 59·9

The lowest                   ,,                   15th, 1881                   ,,                   .... 4·6

The highest adopted mean temperature of the month, 1875 42·5

The lowest                   ,,                   ,,                   1881.... 29·2

## TABLES OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	+	0·442 inches
Monthly range                   ,,	..	..	+	0·080                   ,,
Mean of highest temperatures	..	..	+	3·1 degrees
Mean of lowest                   ,,	..	..	+	2·7                   ,,
Mean daily range                   ,,	..	..	+	0·4                   ,,
Adopted mean temperature	..	..	+	3·2                   ,,
Total rainfall                   ..                   ..                   ..                   ..	..	..	—	0·755 inches

The highest reading of the barometer during the last 49 years occurred on the 9th when the mercury stood at 30·597 inches.

Frost on the 5th, 6th, 8th—12th, 14th, 15th, 20th—23rd, 28th and 29th. Hoar Frost on the 21st. Snow on the 9th. Hail on the 13th and 15th. Heavy Rain on the 14th and 24th. Fog on the 7th. Gales of Wind on the 15th and 16th.

## FEBRUARY, 1896.

Results of Observations taken during the Month.		Mean for the last 49 years.
Mean Reading of the Barometer . . . . . inches	29·868	29·517
Highest                    „            on the 3rd            „	30·316	30·072
Lowest                    „            on the 20th            „	29·160	28·703
Range of Barometer Readings . . . . . „	1·156	1·369
Highest Reading of a Max. Therm. on the 8th	53·8	52·0
Lowest Reading of a Min. Therm. on the 17th	22·5	22·1
Range of Thermometer Readings . . . . .	31·3	29·9
Mean of all the Highest Readings . . . . .	46·0	44·2
Mean of all the Lowest Readings . . . . .	33·7	33·4
Mean Daily Range . . . . .	12·3	10·8
Deduced Monthly Mean (from Mean of Max and Min.) . . . . .	39·5	38·2
Mean Temperature from Dry Bulb . . . . .	40·1	38·2
Adopted Mean Temperature . . . . .	39·8	38·2
Mean Temperature of Evaporation . . . . .	38·2	36·8
Mean Temperature of Dew Point . . . . .	36·2	34·7
Mean elastic force of Vapour . . . . .	0·213 in	0·192 in
Mean weight of Vapour in a cub. ft. of air . . .	2·5gr	2·4gr
Mean additional weight required for saturation	0·5gr	0·4gr
Mean degree of Humidity (saturation 1·00) ..	0·87	0·87
Mean weight of a cubic foot of air . . . . .	554·5gr	549·0gr
Fall of Rain . . . . .	2·691 in	3·477 in
Number of days on which Rain fell . . . . .	13	16·8

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	6	3	3	2	3	11	0
Mean Velocity in miles per hour	1·9	4·4	10·1	6·4	14·9	6·1	10·1	0
Total No. of miles for each Direction	47	632	729	462	713	437	2659	0

The total number of miles registered during the month was 5679.  
The max. Velocity of the wind was 32 miles per hour, S.S.W., on  
the 8th at 2 p.m.



## FEBRUARY, 1896.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·8

In the month of February, the highest reading of the Barometer during 49 years, was on the 11th, in 1849, and was .. 30·452

The lowest                   ,,           6th, 1867                   ,,           .... 28·208

The highest Temperature           8th, 1877                   ,,           .... 58·3

The lowest                   ,,           18th, 1895                   ,,           .... 8·0

The highest adopted mean temperature of the month, 1869.... 44·0

The lowest                   ,,   1855.... 28·6

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure                   ..           .. + 0·351 inches

Monthly range                   ,,                   ..           .. — 0·213                   ,,

Mean of highest temperatures                   ..           .. + 1·8 degrees

Mean of lowest                   ,,                   ..           .. + 0·3                   ,,

Mean daily range                   ,,                   ..           .. + 1·5                   ,,

Adopted mean temperature                   ..           .. + 1·6                   ,,

Total rainfall                   ..           ..                   ..           .. — 0·786 inches

Frost on the 2nd, 4th, 6th, 7th, 13th, 17th—19th, 21st—27th.

Heavy Rain on the 29th. Fog on the 5th, 6th 14th. Lunar Halo on the 24th and 25th.

# MARCH, 1896.

Results of Observations taken during the Month.		Mean for the last 49 years.
Mean Reading of the Barometer..... inches	29·313	29·466
Highest „ on the 10th „	29·880	30·076
Lowest „ on the 3rd „	28·180	28·666
Range of Barometer Readings .....	1·700	1·410
Highest Reading of a Max. Therm. on the 25th	58·0	57·2
Lowest Reading of a Min. Ther. on the 30th	28·8	22·5
Range of Thermometer Readings .....	29·2	34·7
Mean of all the Highest Readings .....	50·3	47·3
Mean of all the Lowest Readings .....	35·3	34·1
Mean Daily Range.....	15·0	13·2
Deduced Monthly Mean (from Mean of Max. and Min.) .....	41·8	39·8
Mean Temperature from Dry Bulb .....	42·6	40·0
Adopted Mean Temperature.....	42·2	39·9
Mean Temperature of Evaporation .....	40·0	37·9
Mean Temperature of Dew Point .....	37·3	35·4
Mean elastic force of Vapour .....	0·223in	0·206in
Mean weight of Vapour in a cub. ft. of air....	2·6gr	2·4gr
Mean additional weight required for saturation	0·5gr	0·5gr
Mean degree of Humidity (saturation 1·00) ..	0·84	0·85
Mean weight of a cubic foot of air .....	541·6gr	546·5gr
Fall of Rain .....	7·079in	3·202in
Number of days on which Rain fell .....	27	17·6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	1	0	1	2	6	16	2
Mean Velocity in miles per hour	7·0	5·8	0	6·8	13·8	7·3	16·4	14·1
Total No. of miles for each Direction	505	139	0	162	664	1052	6288	676

The total number of miles registered during the month was 9486.  
The max. Velocity of the wind was 46 miles per hour, W. by S.,  
on the 16th at 2·0 p.m.

MARCH, 1896.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				8·4
In the month of March, the highest reading of the Barometer during 49 years, was on the 6th in 1852, and was....				30·401
The lowest	„	3rd, 1896	„	.. 28·180
The highest Temperature	„	25th, 1871	„	.. 68·0
The lowest	„	„ 6th, 1886	„	.. 11·5
The highest adopted mean temperature of the month, 1871..				44·0
The lowest	„	„ 1855 and 1892	„	.. 35·6

TABLES OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0·153 inches
Monthly range	„	..	+	0·290 „
Mean of highest temperature	..	..	+	3·0 degrees
Mean of lowest	„	..	+	1·2 „
Mean daily range	„	..	+	1·8 „
Adopted mean temperature	..	..	+	2·3 „
Total rainfall	..	..	+	3·877 inches

Frost on the 3rd, 9th, 10th, 12th—15th, 18th, 19th, 22nd—24th, 27th, 29th—31st. Hoar Frost on the 10th. Snow on the 3rd, 19th, 26th, 28th. Hail on the 3rd, 4th, 5th, 13th, 28th. Heavy rain on the 3rd, 5th, 7th, 10th, 13th, 25th, 27th. Fog on the 10th. Thunder on the 24th, 25th. Lightning on the 24th. Gales of wind on the 1st, 2nd, 6th, 16th, 20th, 26th.

## APRIL, 1896.

Readings taken during the Month.		Mean for 49 yrs
Barometer . . . . inches	29.716	29.7
on the 31st „	30.088	29.7
on the 29th „	29.174	28.7
Readings . . . . . „	0.914	1.0
Max Therm. on the 24th	64.0	6
Min. Therm. on the 30th	30.0	2
Max Readings . . . . .	34.0	3
Min Readings . . . . .	56.2	5
Max Readings . . . . .	39.2	3
. . . . .	17.0	1
Mean (from Mean of Max. . . . . .	46.2	4
Mean Dry Bulb . . . . .	47.0	4
Mean Humidity . . . . .	46.6	4
Evaporation . . . . .	43.7	4
Dew Point . . . . .	40.4	4
Vapour . . . . .	0.252 in	0
in a cub. ft. of air . . . .	3.0 gr	
required for saturation	0.7 gr	
humidity (saturation 1.00) ..	0.80	
cubic foot of air . . . . .	544.6 gr	542.1 gr
. . . . .	3.143 in	2.284 in
inch Rain fell . . . . .	15	14.6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	1	2	0	0	0	0	2
Mean Velocity in miles per hour	7.8	3.9	3.0	0	0	0	11.3	5.3
Total No. of miles for each Direction	187	93	142	0	0	0	6487	256

The total number of miles registered during the month was 7165.  
The max. Velocity of the wind was 38 miles per hour, W., on the

## APRIL, 1896.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·4

In the month of April, the highest reading of the Barometer

during 49 years, was on the 17th, in 1887, and was..... 30·251

The lowest „ 20th, 1868 „ ..... 28·358

The highest Temperature 14th, 1852 „ ..... 74·1

The lowest „ 13th, 1892 „ ..... 20·8

The highest adopted mean temperature of the month, 1865.... 48·5

The lowest „ „ 1879 .... 40·7

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TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure .. .. + 0·227 inches

Monthly range „ .. — 0·247 „

Mean of highest temperatures .. .. + 0·3 degrees

Mean of lowest „ .. + 1·4 „

Mean daily range „ .. — 1·1 „

Adopted mean temperature .. .. + 2·0 „

Total rainfall .. .. + 0·859 inches

Frost on the 1st, 2nd, 3rd, 13th, 15th, 18th, 20th—24th, 30th.

Hail on the 11th, 12th, 13th, 28th, 29th, 30th. Thunder on the 28th.

Lunar Halo on the 18th. Gale of wind on the 11th.

## MAY, 1896.

Results of Observations taken during the Month.		Mean for the last 49 years
Mean Reading of the Barometer . . . . inches	29·860	29·516
Highest                    „            on the 25th   „	30·106	29·953
Lowest                    „            on the 20th   „	29·390	28·956
Range of Barometer Readings . . . . . „	0·716	0·997
Highest Reading of a Max. Therm. on the 12th	76·0	72·2
Lowest Reading of a Min. Therm. on the 3rd	32·0	31·3
Range of Thermometer Readings . . . . .	44·0	40·9
Mean of all the Highest Readings . . . . .	65·2	59·9
Mean of all the Lowest Readings . . . . .	42·6	42·1
Mean Daily Range . . . . .	22·6	17·8
Deduced Monthly Mean (from Mean of Max. and Min. . . . .	52·2	49·2
Mean Temperature from Dry Bulb . . . . .	53·6	49·7
Adopted Mean Temperature . . . . .	52·9	49·4
Mean Temperature of Evaporation . . . . .	48·6	46·2
Mean Temperature of Dew Point . . . . .	44·3	42·6
Mean elastic force of Vapour . . . . .	0·292 in	0·277 in
Mean weight of Vapour in a cub. ft. of air . . .	3·3 gr	3·1 gr
Mean additional weight required for saturation	1·3 gr	0·9 gr
Mean degree of Humidity (saturation 1·00) ..	0·73	0·76
Mean weight of a cubic foot of air . . . . .	539·7 gr	537·1 gr
Fall of Rain . . . . .	0·760 in	2·553 in
Number of Days on which rain fell . . . . .	5	15·1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	8	7	0	0	1	12	1
Mean Velocity in miles per hour	10·6	5·6	7·9	0	0	10·2	7·8	4·5
Total No. of miles for each Direction.	509	1071	1321	0	0	245	2242	108

The total number of miles registered during the month was 5496.  
The max. Velocity of the wind was 30 miles per hour, W. by N.  
on the 20th at 3 a.m. Also 30 miles per hour, direction W. on the  
29th at noon.

## MAY, 1896.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 5·8

In the month of May, the highest reading of the Barometer  
during 49 years, was on the 2nd in 1895, and was..... 30·217

The lowest                   ,,           28th, 1877                   ,,           ..... 28·559

The highest Temperature   19th, 1864                   ,,           ..... 82·5

The lowest                   ,,           4th, 1855                   ,,           ..... 23·5

The highest adopted mean temperature of the month, 1848   55·1

The lowest                   ,,                                   ,,                                   1855   45·0

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TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the  
monthly average.

Mean barometric pressure                   ..           ..   +   0·344 inches

Monthly range                   ,,                   ..           ..   —   0·281           ,,

Mean of highest temperatures           ..           ..   +   5·3 degrees

Mean of lowest                   ,,                   ..           ..   +   0·5           ,,

Mean daily range                   ,,                   ..           ..   +   4·8           ,,

Adopted Mean temperature           ..           ..   +   3·5           ,,

Total rainfall           ..           ..           ..           ..   —   1·793 inches

Frost on the 1st, 3rd, 4th, 21st.   Hail on the 20th.   Thunder on  
the 20th.

## JUNE, 1896.

Readings taken during the Month	Mean for the last 49 years.
Barometer ..... inches 29 525	29-543
on the 29th „ 29 828	29-896
on the 7th „ 29-101	29-037
Readings..... „ 0-727	0-859
ix. Therm. on the 14th & 15th 82 7	77 5
in. Therm. on the 25th 42 7	38 8
Readings ..... 40-0	38-7
t Readings ..... 70-8	65-9
Readings ..... 51-2	47 9
..... 19-6	18-0
n (from Mean of Max. .... 59 2	55-1
m Dry Bulb ..... 59 3	55-2
ature :..... 59 3	55 1
Evaporation ..... 55-0	52-0
Dew Point ..... 51-2	48-6
apour ..... 0-377 in	0 354 in
in a cubic ft. of air.. ... 4-2gr	3 9gr
required for saturation 1 4gr	0-9gr
hity (saturation 100) 0 75	0-79
foot of air ..... 526 6gr	531-2gr
..... 3-613 in	3 618 in
ch Rain fell..... 15	16-1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	3	2	1	2	2	17	1
Mean Velocity in miles per hour	8 1	6-3	5 7	5-5	9-3	6-0	9-9	3-5
Total No. of miles for each Direction	194	454	278	181	447	287	4036	170

The total number of miles registered during the month was 5992.  
The max Velocity of the wind was 35 miles per hour, W N.W.,  
on the 30th at 1 p.m



**JUNE, 1896.**

**Mean amount of Cloud (an overcast sky being indicated by 10·0)**      6·9

**In the month of June, the highest reading of the Barometer during 49 years, was on the 15th, in 1874, and was ..... 30·219**

**The lowest**                    „                    **23rd, 1893**                    „                    **..... 28 813**

**The highest Temperature**      **18th, 1893**      ,,      .....      **88·7**

**The lowest**                    „        **17th, 1892**                    „        .....        **34.1**

**The highest adopted mean temperature of the month, 1858 .. 59.0**

<b>The lowest</b>	„	„	<b>1856 and 1860..</b>	<b>52·2</b>
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## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

**Mean barometric pressure** .. .. — 0·018 inches

**Monthly range**      „      „      „ — 0.132      „

**Mean of highest temperatures** .. .. + 4.9 degrees

**Mean of lowest**      „      „      „      +      3.3      „

**Mean daily range**    „    ..    ..    +    1.6    „

**Adopted mean temperature .. .. + 4.2 ..**

**Total rainfall** .. .. — 0·005 inches

**Heavy Rain on the 4th and 22nd. Thunder on the 3rd, 4th, 6th, 7th, 8th, and 16th. Lightning on the 6th and 7th.**

	Mean for 2 last 49 years.
	29.502
	29.379
	28.904
	0.885
	78.7
	42.1
	36.6
	67.9
	50.7
	17.2
	57.7
	57.7
	57.7
	54.7
	52.1
	0.369in
	4.5gr
	1.0gr
	0.82
	527.4gr
	4.212in
	18.1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	2	1	1	2	2	18	2
Mean Velocity in miles per hour	6.7	5.7	6.6	15.4	7.9	7.0	7.8	13.8
Total No. of miles for each Direction	480	272	159	870	390	338	3368	660

The total number of miles registered during the month was 6027.  
The max. Velocity of the wind was 30 miles per hour, W.N.W.,  
on the 4th at 4.0 p.m. Also some velocity at 4.30 p.m. on the 25th.  
Direction S. b E.

## JULY, 1896.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·2

In the month of July, the highest reading of the Barometer  
during 49 years, was on the 24th, in 1868, and was ..... 30·112

The lowest                   ,,           15th, 1877                   ,,           ..... 28·564

The highest Temperature   22nd, 1873                   ,,           ..... 88·2

The lowest                   ,,           1st, 1857                   ,,           ..... 36·0

The highest adopted mean temperature of the month, 1852.... 63·0

The lowest                   ,,                   ,,                   1888.... 54·5

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TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure   ..           .. + 0·097 inches

Monthly Range               ,,           .. — 0·160   ,,

Mean of highest temperatures ..           .. + 1·4 degrees

Mean of lowest               ,,           .. — 0·1   ,,

Mean daily range           ,,           .. + 1·5   ,,

Adopted mean temperature   ..           .. + 0·8   ,,

Total rainfall               ..           .. — 1·623 inches

Thunder and Lightning with Heavy Rain on the 9th.

## AUGUST, 1896.

Results of Observations taken during the month.		Mean for the last 49 years.
Mean Reading of the Barometer .. inches	29.608	29.489
Highest " on the 10th "	29.896	29.884
Lowest " on the 26th "	29.170	28.949
Range of Barometer Readings .....	0.726	0.935
Highest Reading of a Max Therm. on the 1st	72.5	76.9
Lowest Reading of a Min. Therm. on the 26th	40.0	41.2
Range of Thermometer Readings .....	32.5	35.7
Mean of all the Highest Readings .....	64.7	67.1
Mean of all the Lowest Readings.....	48.7	50.4
Mean Daily Range.....	16.0	16.7
Deduced Monthly Mean (from Mean of Max. and Min.) .....	55.0	57.1
Mean Temperature from Dry Bulb .....	55.3	57.5
Adopted Mean Temperature .....	55.2	57.3
Mean Temperature of Evaporation .....	52.0	54.5
Mean Temperature of Dew Point .....	48.9	51.7
Mean elastic force of Vapour .....	0.347 in	0.337 in
Mean weight of Vapour in a cub. ft. of air ....	3.9 gr	4.3 gr
Mean additional weight required for saturation	1.0 gr	0.9 gr
Mean degree of Humidity (saturation 1.00) ..	0.80	0.83
Mean weight of a cubic foot of air .....	532.0 gr	527.4 gr
Fall of Rain .....	3.300 in	5.036 in
Number of Days on which rain fell .....	19	19.1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	5	5	0	0	1	2	15	3
Mean Velocity in miles per hour	4.2	5.8	0	0	14.8	10.8	10.0	8.0
Total No. of miles for each Direction	509	694	0	0	356	517	3593	579

The total number of miles registered during the month was 6248.  
 The max. Velocity of the wind was 34 miles per hour, S. b E. on the 30th, at 8.0 a.m.

## AUGUST, 1896.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·7

In the month of August, the highest reading of the Barometer during 49 years, was on the 21st, in 1874, and was .... 30·114

The lowest ,, 31st, 1876 ,, .. 28·555

The highest Temperature 2nd, 1868 ,, .... 88·0

The lowest ,, 13th, 1887 ,, .... 83·4

The highest adopted mean temperature of the month, 1857 & '84 61·0

The lowest ,, ,, 1848 .... 52·5

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure .. .. + 0·119 inches

Monthly range ,, .. — 0·209 ,,

Mean of highest temperatures .. .. — 2·4 degrees

Mean of the lowest ,, .. — 1·7 ,,

Mean daily range ,, .. — 0·7 ,,

Adopted mean temperature .. .. — 2·1 ,,

Total rainfall .. .. — 1·736 inches

Heavy Rain on the 23rd and 25th. Thunder on the 19th and 26th. Lightning on the 26th. Solar Halo on the 18th.

# SEPTEMBER, 1896.

Results of Observations taken during the Month.		Mean for the last 49 years.
Mean Reading of the Barometer .....	inches 29 300	29·517
Highest .....	on the 30th ,, 30·076	30·026
Lowest .....	on the 25th ,, 28·314	28·849
Range of Barometer Readings .....	,, 1·762	1·177
Highest Reading of a Max. Therm. on the 1st & 10th	70·0	72·5
Lowest Reading of a Min. Therm. on the 28th	37 9	36·5
Range of Thermometer Readings .....	32·1	36·0
Mean of all the Highest Readings .....	62·1	62·3
Mean of all the Lowest Readings .....	48·2	47·0
Mean Daily Range .....	13·9	15·3
Deduced Monthly Mean (from Mean of Max. and Min.) .....	53 9	53·5
Mean Temperature from Dry Bulb.....	54·3	54·1
Adopted Mean Temperature.....	54·1	53·8
Mean Temperature of Evaporation .....	51·4	51·0
Mean Temperature of Dew Point .....	48·8	48·3
Mean elastic force of Vapour .....	0·343in	0·340in
Mean weight of Vapour in a cub. ft. of air.....	3 9gr	4 0gr
Mean additional weight required for saturation	0·8gr	0 8gr
Mean degree of Humidity (saturation 1·00)...	0·81	0·82
Mean weight of a cubic foot of air .....	528·1gr	532·2gr
Fall of Rain .....	7·062in	4·597 in
Number of days on which Rain fell .....	25	17·9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	4	4	1	2	4	11	1
Mean Velocity in miles per hour	9·1	7·8	7·0	4·3	11·6	11·9	12·4	6·8
Total No. of miles for each Direction	655	745	670	103	558	1146	3268	163

The total number of miles registered during the month was 7808.  
The max. Velocity of the wind was 33 miles per hour, on the 14th at 6·0 p.m., 17th at 4·0 p.m., 22nd at noon, and 23rd at 9·0 a.m. Direction being respectively W. by S., S. by W., S. by E. and W.N.W.

**SEPTEMBER, 1896.**

<b>Mean amount of Cloud (an overcast sky being indicated by 10·0)</b>				<b>9·2</b>
<b>In the month of September, the highest reading of the Bar-</b>				
<b>ometer during 49 years, was on the 15th, in 1851, and was...</b>				<b>30·274</b>
<b>The lowest</b>	<b>„</b>	<b>25th, 1896</b>	<b>„</b>	<b>... 28·314</b>
<b>The highest Temperature</b>		<b>6th, 1868</b>	<b>„</b>	<b>... 85·0</b>
<b>The lowest</b>	<b>„</b>	<b>25th, 1885, and 30th, 1888...</b>		<b>29·8</b>
<b>The highest adopted mean temperature of the month, 1865 ...</b>				<b>59·1</b>
<b>The lowest</b>	<b>„</b>	<b>„</b>	<b>1863 ...</b>	<b>50·9</b>

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0·217 inches
Monthly range	„	..	+	0·585 „
Mean of highest temperatures	..	..	—	0·2 degrees
Mean of lowest	„	..	+	1·2 „
Mean daily range	„	..	—	1·4 „
Adopted mean temperature	..	..	+	0 3 „
Total rainfall	..	..	+	2·495 inches

Hail on the 27th. Heavy Rain on the 22nd, 24th and 27th. Fog on the 30th. Thunder on the 9th, 11th, 12th, 13th, 16th, 27th and 28th. Lightning on the 9th, 11th, 12th, 18th and 27th.

## OCTOBER, 1896.

Results of Observations taken during the Month.		Mean for the last 49 years
Mean Reading of the Barometer..... inches	29.295	29.420
Highest „ on the 1st „	30.062	30.019
Lowest „ on the 19th & 25th „	28.696	28.640
Range of Barometer Readings .....	1.366	1.379
Highest Reading of a Max. Therm. on the 2nd	61.0	64.2
Lowest Reading of a Min. Therm. on the 26th	23.0	28.7
Range of Thermometer Readings.....	38.0	35.5
Mean of all the Highest Readings.....	51.0	54.5
Mean of all the Lowest Readings.....	36.6	41.4
Mean Daily Range .....	14.4	13.1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	42.8	47.0
Mean Temperature from Dry Bulb .....	43.5	47.5
Adopted Mean Temperature .....	43.2	47.3
Mean Temperature of Evaporation.....	40.5	45.1
Mean Temperature of Dew Point .....	37.3	42.6
Mean elastic force of Vapour .....	0.223 in	0.274 in
Mean weight of Vapour in a cub. ft. of air .....	2.6 gr	3.1 gr
Mean additional weight required for saturation	0.6 gr	0.6 gr
Mean degree of Humidity (saturation 1.00)...	0.80	0.84
Mean weight of a cubic foot of air.....	540.2 gr	537.6 gr
Fall of rain .....	4.158 in	5.063 in
Number of Days on which rain fell .....	18	21.6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	11	3	0	0	2	7	5	3
Mean Velocity in miles per hour	7.8	5.2	0	0	22.6	10.6	9.1	4.9
Total No. of miles for each Direction	21						37 355	

The total No. of miles registered during the month was 6749.  
The max. Velocity of the wind was 51 miles per hour, S. by W.,  
on the 8th at 8.0 and 9.0 a.m.



## OCTOBER, 1896.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·7

In the month of October, the highest reading of the Barometer during 49 years, was on the 5th, in 1884, and was .... 30·306

The lowest ,, 19th, 1862 ,, .... 28·139

The highest Temperature 9th, 1869 ,, .... 72·8

The lowest ,, 28th, 1895 ,, .... 17·8

The highest adopted mean temperature of the month, 1861 & '76 51·6

The lowest ,, ,, 1895 .... 42·8

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TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0·125 inches
Monthly range	..	..	—	0·013 ..
Mean of highest temperatures	..	..	—	3·5 degrees
Mean of lowest	..	..	—	4·8 ..
Mean daily range	..	..	+	1·8 ..
Adopted mean temperature	..	..	—	4·1 ..
Total rainfall	..	..	—	0·905 inches

Frost on the 11th—14th, 19th—29th. Hoar frost 27th. Snow 11th, 24th and 25th. Hail 4th, 5th, 11th, and 24th. Fog 28th. Thunder 5th and 10th. Lightning 5th, 8th, 10th and 29th. Gale of wind 8th. Aurora Borealis 12th.

# NOVEMBER, 1896.

Results of Observations taken during the Month.		Mean for the last 49 years
Mean Reading of the Barometer..... inches	29.735	29.331
Highest                   "                   on the 24th   ,,	30.254	30.059
Lowest                   "                   on the 14th   ,,	28.777	28.564
Range of Barometer Readings .....	1.477	1.495
Highest Reading of a Max. Therm. on the 12th	52.0	55.7
Lowest Reading of a Min. Therm. on the 5th ...	21.0	25.4
Range of Thermometer Readings .....	31.0	30.3
Mean of all the Highest Readings.....	46.2	47.1
Mean of all the Lowest Readings.....	33.2	36.3
Mean Daily Range .....	13.0	10.8
Deduced Monthly Mean (from Mean of Max. and Min.) .....	39.3	41.3
Mean Temperature from Dry Bulb.....	39.5	41.6
Adopted Mean Temperature .....	39.4	41.5
Mean Temperature of Evaporation .....	38.0	39.2
Mean Temperature of Dew Point.....	36.2	37.9
Mean elastic force of Vapour .....	0.214 in	0.229 in
Mean weight of Vapour in a cub. ft. of air.....	2.5 gr	2.6 gr
Mean additional weight required for saturation	0.4 gr	0.4 gr
Mean degree of Humidity (saturation 1.00)...	0.89	0.87
Mean weight of a cubic foot of air .....	552.4 gr	544.9 gr
Fall of Rain .....	1.536 in	4.214 in
Number of days on which Rain fell.....	12.0	19.4

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	6	7	2	0	2	3	10	0
Mean Velocity in miles per hour	6.2	7.4	14.0	0	10.5	6.1	7.1	0
Total No. of miles for each Direction	894	1237	671	0	502	442	1713	0

The total number of miles registered during the month was 5459.  
The max. Velocity of the wind was 34 miles per hour, S. by E.,  
on the 14th at 5 p.m.

NOVEMBER, 1896.

**Mean amount of Cloud (an overcast sky being indicated by 10·0) 6·6**

In the month of November, the highest reading of the Barometer during 49 years was on the 12th, in 1857, and was 30·350

The lowest                      „                      11th, 1891                      „                      27·938

The highest Temperature	2nd, 1894	„	62.0
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The lowest	„	17th, 1861	„	19·1
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**The highest adopted mean temperature of the month, 1881 47·0**

The lowest	"	"	1851	36·7
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## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

**Mean barometric pressure** ... .. + 0·404 inches

**Monthly range**      „      ...      ...      —      0 018      „

**Mean of highest temperatures** ... — 0·9 degrees

**Mean of lowest**        „        ..        ... —        3.1        „

**Mean daily range**    „                    ...                    ...    +    2·2    „

Adopted mean temperature .. ... + 2.1 „

**Total rainfall**      ...      ...      ...      ... — 2.678 inches

**Frost on the 1st—6th, 8th, 9th, 13th—19th, 21st, 25th, 29th, and 30th. Hoar Frost 6th.**

## DECEMBER, 1896.

Results of Observations taken during the Month.		Mean for the last 49 years
Mean Reading of the Barometer .... inches	29.303	29.455
Highest .. on the 20th & 29th	29.875	30.071
Lowest .. on the 6th	28.848	28.589
Range of Barometer Readings .....	1.527	1.482
Highest Reading of a Max. Therm. on the 26th	58.0	53.0
Lowest Reading of a Min. Ther. on the 23rd & 28th	24.0	20.2
Range of Thermometer Readings .....	29.0	32.8
Mean of all the Highest Readings .....	48.5	43.0
Mean of all the Lowest Readings .....	33.0	32.9
Mean Daily Range .....	10.5	10.1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	38.1	37.9
Mean Temperature from Dry Bulb .....	39.4	38.6
Adopted Mean Temperature .....	38.9	38.3
Mean Temperature of Evaporation.....	37.3	36.7
Mean Temperature of Dew Point .....	35.2	34.9
Mean elastic force of Vapour .....	0.206 in	0.204 in
Mean weight of Vapour in a cub. ft. of air	2.4 gr	2.4 gr
Mean additional weight required for saturation	0.5 gr	0.4 gr
Mean degree of Humidity (saturation 1.00) ..	0.87	0.87
Mean weight of a cubic foot of air .....	545.1 gr	548.3 gr
Fall of Rain .....	5.888 in	5.275 in
Number of days on which Rain fell .....	22	18.9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	4	2	6	0	3	6	8	2
Mean Velocity in miles per hour	6.8	4.5	9.5	0	12.1	14.6	9.7	4.7
Total No. of miles for each direction	648	217	1382	0	869	2115	1134	227

The total number of miles registered during the month was 7320.  
 The max. Velocity of the wind was 39 miles per hour, S. S. W.,  
 on the 30th, at 8.0 p.m.

## DECEMBER, 1896.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·8

In the Month of December, the highest reading of the Barometer during 49 years, was on the 22nd, in 1849, and was 30·378

The lowest	„	8th, 1886	„	....	27·350
The highest Temperature		9th, 1876	„	....	58·1
The lowest	„	24th, 1860	„	....	6·7
The highest adopted mean temperature of the month		1857..			44·6
The lowest	„	1878	„	....	30·3

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	—	0·152 inches
Monthly range	„	..	+	0·045 „
Mean of highest temperatures	..	..	+	0·5 degrees
Mean of lowest	„	..	+	0·1 „
Mean daily range	„	..	+	0·4 „
Adopted mean temperatures	..	..	+	0·6 „
Total rainfall	..	..	+	0·113 inches

Frost 1st, 6th, 12th—15th, 28th, 29th. Hoar Frost 23rd. Snow 15th, 16th, 17th, 18th, and 22nd. Heavy rain, 24th, 25th, and 27th. Fog 11th, 16th, and 23rd. Gales of wind 28th and 30th.

## Summary of Observations FOR 1896

Results of Observations taken during the Year.			Mean for the last 49 years.
Mean Reading of the Barometer . . . . inches	29·584		29·491
Highest                   ,,                   on January 9th ,,	30·597		30·284
Lowest                   ,,                   on March 3rd ,,	28·180		28·264
Range of Barometer Readings . . . . . ,,	2·417		2·020
Highest Reading of a Max. Ther. on June 14th and 15th. . . . .	82·7		81·6
Lowest Reading of a Min Therm. on Nov. 5th	21·0		15·3
Range of Thermometer Readings . . . . .	61·7		66·3
Mean of all the Highest Readings . . . . .	55·9		54·8
Mean of all the Lowest Readings . . . . .	40·6		40·6
Mean Daily Range. . . . .	15·3		14·2
Deduced yearly Mean (from Mean of Max. and Min.) . . . . .	47·3		46·8
Mean Temperature from dry bulb, .. . . .	47·8		46·7
Adopted Mean Temperature . . . . .	47·5		46·8
Mean Temperature of Evaporation . . . . .	44·9		44·5
Mean Temperature of Dew Point . . . . .	42·1		42·1
Mean elastic force of Vapour . . . . .	0·275 in		0·273 in
Mean weight of Vapour in a cub. ft. of air . . . .	3·2 gr		3·3 gr
Mean additional weight required for saturation	0·8 gr		0·7 gr
Mean degree of Humidity (saturation 1·00)..	0·82		0·84
Mean weight of a cubic foot of air . . . . .	540·7 gr		539·2 gr
Total fall of rain in the year. . . . .	44·693 in		47·17 in
Number of days per month on which rain fell	16·8		18·0

The Maximum monthly mean height of the Barometer was  
in February, 1891, and was . . . . . inches 29·997

The Minimum                   ,,                   in December, 1868, and was 28·984

The Maximum yearly mean height of the Barometer was in  
1896, and was . . . . . 29·584

The Minimum                   ,,                   in 1866, and was . . . . . 29·389



DATES OF OCCASIONAL PHENOMENA.

1896.	Frost.	Hoar Frost.	Snow.	Hail.	Gales of Wind.
January	5, 6, 8-12, 14, 15, 20-23, 28, 29	21	9	13, 15	15, 16
February	2, 4, 6, 7, 13, 17-19, 21-27	10	3, 19, 26, 28	3, 4, 5, 13, 28	1, 2, 6, 16, 20, 26
March	3, 9, 10, 12-15, 18, 19, 22-24, 27, 29-31			11, 12, 18, 28, 29, 30	11
April	1-3, 13, 15, 18, 22-24, 30			20	.
May	1, 3, 4, 21				
June					
July					
August					
September				27	8
October	11-14, 19-29	27	11, 24, 25	4, 5, 11, 24	
November	1-6, 8, 9, 13-19, 21, 25, 29, 30	6			
December	1, 6, 12-25, 28, 29	23	15, 16, 17, 18, 22		28, 30



DATES OF OCCASIONAL PHENOMENA.

(Continued.)

1896	Heavy Rain	Fog	Thunder	Lightning	Lunar Halo	Solar Halo
January	14, 24	7				
February	29	5, 6, 14			24, 25	
March	3, 5, 7, 10, 13, 25, 27	10	24, 25	24	18	
April			28			
May			20			
June	4, 22		3, 4, 6, 7, 8, 16	6, 7		
July.	9		9	9		
August	23, 25		19, 26	26		18
September	22, 24, 27	30	9, 11, 12, 13, 16, 27, 28	9, 11, 12, 18, 27		
October		28	5, 10	5, 8, 10, 29		
November						
December	24, 25, 27	11, 16, 23				

Aurora Borealis on October 12th, at 6-30 p.m.

SUMMARY OF SOLAR OBSERVATIONS.

Number of days of Observation in each Month.

1896.	Recorded Sunshine.	Amount of Sunshine expressed in hours.	Number of Sun Drawings 10½ inches to diameter.	Solar Spectrum Photographs.	
January .....	10	24.6	5	4	
February .....	14	33.8	7	1	
March .....	26	96.0	8	2	
April .....	28	166.6	16	15	
May .....	29	289.0	21	40	
June .....	30	210.6	13	25	
July .....	30	191.1	19	26	
August .....	30	114.7	2	2	
September ...	25	62.9	7		
October .....	24	81.8	9	7	
November ...	19	60.0	10	16	
December ...	11	17.8	8	1	
Totals .....	276	1298.9	125	139	

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## TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January -	0	0	0	0	0	0	0	1.6	0	1.0	0	0	0.8	2.8	0.7	0	0
February -	0	0	0	0	0.2	0.1	1.8	0	6.2	0	1.2	0	0.5	1.3	0	0	0
March -	4.5	0.1	3.7	4.2	3.7	0	0	0	1.8	0.5	2.8	7.3	0	4.8	2.1	2.8	1.9
April -	6.7	9.6	1.2	0	2.2	4.4	3.5	1.1	5.8	9.6	5.8	8.4	10.2	0	11.2	0.8	8.8
May -	7.3	0.1	5.2	7.0	10.2	14.0	9.4	13.8	13.4	14.8	13.9	13.8	10.7	10.2	3.0	0	7.5
June -	10.8	4.9	1.8	2.8	8.6	4.2	1.4	3.8	3.8	4.5	8.8	3.1	9.2	12.4	12.3	8.2	2.4
July -	5.8	7.4	2.6	2.0	13.6	10.8	5.2	1.5	0	8.0	7.9	11.1	12.7	5.5	2.2	14.2	8.4
August -	9.2	1.2	3.5	0.6	3.0	10.2	3.7	4.5	2.2	6.0	4.4	0.7	1.4	3.4	6.7	10.2	3.6
September -	5.4	0.4	0.8	0.1	0	0	2.4	2.7	0	3.6	0.6	0	2.2	0.3	0.8	2.0	2.4
October -	0	0	0.4	0.5	4.3	0	0	4.8	7.2	0.6	0.3	9.3	8.0	6.2	0.7	3.8	3.3
November -	1.8	3.0	6.8	5.4	3.2	4.8	0	6.2	7.0	0	0	1.0	0	0	1.9	0.5	4.2
December -	0	0	0.4	0	0	0	0	0	0	0	1.2	0	1.0	0	0	0	2.4

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.  
(Continued.)

MONTH.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Per centage each month.
January -	2.8	4.5	0	0	3.2	0	0	0	0	0	5.5	2.2	0	0	24.6	9.5
February -	0	0.8	0	2.8	2.2	8.8	4.0	0	3.5	0	0.4	0	0	0	33.8	11.7
March -	1.2	0	4.0	3.9	0.8	7.4	2.7	0.5	3.0	8.7	4.9	9.7	8.6	0.4	96.0	26.2
April -	10.9	5.0	0.9	6.4	4.2	5.6	9.2	6.9	6.1	1.5	6.6	9.2	4.8	0	166.6	40.1
May -	2.3	9.0	5.8	9.5	0	3.9	6.6	6.8	7.0	9.0	9.4	4.2	4.8	7.4	239.0	49.6
June -	11.4	12.3	7.4	10.6	12.2	5.0	9.4	3.8	11.7	0.3	11.0	7.3		0	210.6	42.6
July -	0.4	11.8	11.7	6.7	7.0	7.4	0.2	0.3	3.7	3.3	10.7	1.6	1.5	6.4	191.1	38.5
August -	8.2	3.9	1.5	5.8	1.5	0.3	5.4	5.6	2.7	0.5	0.2	1.8	2.8	0	114.7	25.6
September -	1.3	7.7	8.2	3.1	0.2	0.2	2.1	0.6	0	0.5	8.2	1.8	5.3	0	62.9	16.7
October -	0.9	0	7.6	7.5	0.4	3.8	0.7	0	0.8	0	1.4	2.0	5.8	2.0	81.8	24.8
November -	0.7	3.8	3.7	0	0	0	0	0	2.0	0.1	0	2.1	2.8	0	60.0	22.8
December -	1.1	4.9	1.0	1.5	0	0	0	0.2	0	3.8	0.3	0	.0	0	17.8	7.4

MONTHLY TABLES FOR EACH HOUR OF RECORDED SUNSHINE																	
Local apparent time.	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9
January - -	0	0	0	0	0	2.0	3.8	5.0	5.3	5.0	2.5	1.0	0	0	0	0	0
February - -	0	0	0	0.5	1.0	2.9	4.0	4.9	5.8	5.4	5.5	3.4	0.4	0	0	0	0
March - -	0	0	1.7	5.3	9.5	11.5	10.4	11.2	9.5	8.9	10.1	8.7	6.9	2.3	0	0	0
April - -	0	0	4.6	10.3	12.5	15.1	15.7	15.5	14.3	16.1	17.2	15.7	16.9	11.1	1.6	0	0
May - -	0.4	8.9	12.6	16.8	19.4	20.3	17.3	19.0	19.8	19.6	20.6	17.7	17.4	15.4	12.0	1.8	0
June - -	0.9	6.6	10.9	12.8	15.0	16.6	17.7	17.9	19.0	18.0	17.0	16.5	15.4	12.7	10.7	2.9	0
July - -	0.8	7.2	13.0	12.9	14.5	12.9	13.4	15.2	15.0	16.6	14.4	14.0	13.3	13.6	10.5	3.8	0
August - -	0	0.4	3.9	7.4	7.4	7.6	7.2	6.1	11.5	12.5	11.5	13.0	11.5	10.5	3.9	0.3	0
September - -	0	0	0	3.6	5.4	4.5	9.0	8.6	7.3	5.8	6.4	6.5	4.7	1.1	0	0	0
October - -	0	0	0	1.5	6.5	8.9	8.9	10.3	10.6	11.4	11.3	8.5	3.9	0	0	0	0
November - -	0	0	0	0.3	1.5	5.0	11.1	11.8	10.6	9.7	6.5	3.5	0	0	0	0	0
December - -	0	0	0	0	0	1.7	4.2	2.9	2.1	3.9	3.0	0	0	0	0	0	0
Total - -	2.1	28.1	46.7	71.4	92.7	109.0	122.7	128.4	130.8	132.9	126.0	108.5	90.4	66.7	38.7	8.8	0

## OBSERVATIONS OF UPPER CLOUDS (CIRRUS.)

Date. 1896.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds
		Direction	Velocity (0—6).	Direction.	Force. (0—12)	
January 19	10am	SW	2	WSW	1	
„ 20	10am	NW	2	N b W	0	
„ 29	10am	SW b S	3	W b S	0	SWb W
February 7	2pm	W b N	2	SSW	2	SW
„ 11	Noon	SE b S	3	W b S	3	W
„ 13	9am	SE b S	2	NE b N	1	NW
„ 14	1-30pm	E b S	2	W	3	W
„ 24	9-10am	N b W	2	E b N	1	
„ 26	Noon	N	3	SE	0	
March 5	9am	NW b N	3	WNW	4	W
„ 12	9am	E b S	2	ENE	1	NE
„ 22	9-10am	N b W	2	W	0	S
„ 23	9 15am	NNW	2	SW b W	2	SW
„ 27	10-55am	WNW	2	WNW	5	NW
„ 30	7-45am	N b W	2	NNE	1	
April 2	10am	N	2	N	1	NNE
„ 3	5-20pm	N	3	ENE	1	
„ 6	4pm	NW	1	W	3	W
„ 9	9-30am	N b W	2	WSW	2	W
„ 13	9am	NW	2	NW b W	3	NWb W
„ 17	6-30pm	W	3	W	3	SWb W
„ 18	10am	WNW	2	ESE	0	NW
„ 24	4pm	NW b W	2	W	2	SW
„ 27	4-30pm	W	3	W b S	4	SWb W
May 5	1-45pm	NW	3	WNW	2	W
„ 6	8-30am	NNE	2	ENE	2	
„ 7	5-45pm	NNW	3	ENE	2	W
„ 8	9-30am	NE b N	2	E b N	2	
„ 13	10 50am	SE	2	WSW	2	W
„ 16	9-15am	W b N	2	NE b E	0	W
„ 19	7-30am	W b S	3	WNW	2	W
„ 20	Noon	SE b S	3	N b W	5	NW
„ 21	7-30am	N b E	2	N b W	1	NW
„ 27	7-15am	SE b E	3	NE b E	1	NE
„ 28	10-30am	WNW	2	E	1	NE
„ 29	11-45am	NW	3	NW	5	W
June 1	5-30pm	NW	3	NNW	0	W
„ 2	9am	W	2	NNE	1	
„ 6	8-30am	E b S	2	SSE	1	SE
„ 8	4pm	S	3	N	1	NW

OBSERVATIONS OF UPPER CLOUDS (*Continued*).

Date. 1896.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.	
		Direction.	V'locity (0—6).	Direction.	Force. (0—12)		
June	9	9am	SW b S	2	NE b E	1	NE
"	10	8-30pm	NNW	2	N b W	2	N
"	12	7am	SW	3	NW b W	0	
"	13	7-45am	S	2	NW	0	SW
"	14	9-30am	S b W	2	E b N	0	NW
"	16	Noon	SW b W	3	ESE	2	W
"	18	2pm	SW	3	W b S	3	W
"	19	4pm	W	3	W	3	W b S
"	22	9am	NW	3	WNW	2	W
"	28	Noon	W	3	WNW	4	SW
"	30	5-20pm	NW	2	WNW.	4	W
July	2	Noon	NW b W	3	W	2	NW
"	5	10am	NW b W	2	W b S	3	W
"	6	9am	S	2	W	1	SW
"	7	9am	S b W	2	WSW	1	SW
"	12	5pm	W	2	WNW	2	W
"	13	8-30am	NW	2	NNE	0	S b E
"	14	2pm	SSE	2	W	2	SW
"	16	3pm	NE	2	NE	1	SW
"	17	5-30pm	NW	2	W b N	1	
"	19	2pm	NW	2	W	3	SE
"	23	2pm	SW	3	W b S	4	SW
August	6	2pm	SW	2	W	3	W
"	9	5pm	SW	3	NE	1	NW
"	10	7-30pm	NE	3	NE b E	1	W
"	11	5pm	NW	2	W	3	W
"	12	5pm	NW	3	W b N	3	W
"	15	6-30pm	W b N	3	NW	1	NW
"	16	9am	NW b N	2	WSW	2	W
"	17	5pm	N b W	3	SW b W	1	S
"	18	3pm	S	2	W	3	W
"	20	7pm	NE	3	SW b W	1	SW
"	24	4 30pm	NW	1	W b S	3	W
Sept.	1	7-30am	ESE	2	N b E	0	N b W
"	1	Noon	E b S	2	NW b N	1	NW
"	9	4pm	NW	2	ENE	1	NE
"	10	4pm	NNW	2	ESE	1	NE
"	15	4pm	W b S	3	S	2	SW
"	18	9am	W	2	SW b W	2	SW
"	18	10am	SW b W	2	WSW	2	SW
"	18	10 30am	SW	3	WSW	2	SW
"	23	5-45pm	NW	2	WNW	6	W



OBSERVATIONS OF UPPER CLOUDS (*Continued*).

Date. 1896.		G M.T.	Cloud.		Wind.		Direction of Lower Clouds.
			Direction.	V'locity (0—6.)	Direction.	Force. (0—12.)	
Sept.	24	5-50pm	W	3	SW b W	1	SW
„	30	Noon	N	3	WSW	1	W
Oct.	7	7am	NW	3	SW	1	SW
„	12	7-30am	NNW	3	N	2	NE
„	17	8-30am	NE b W	3	NNE	1	
„	21	8am	NW b W	2	NNE	1	NE
„	22	8am	N b W	3	S b E	0	SW
„	26	2pm	W b S	3	NW b N	1	NW
„	28	9am	NW b W	2	NW b W	0	
„	28	2pm	NW	2	SW b W	1	NE
„	29	8-30am	ENE	2	ENE	0	NE
Nov.	2	7-30am	NW	3	N b E	1	
„	3	8am	WNW	3	NNE	1	NE b N
„	4	9am	N b W	2	NNW	1	NW
„	6	10am	N	2	NNE	0	NE
„	11	4pm	N	2	WSW	2	WSW
„	17	Noon	NW b N	2	NE b N	0	NE
„	17	2pm	N	3	NE b N	0	NE
„	19	Noon	NNW	2	SW	1	SW
„	27	8-30am	E	2	ENE	1	NE
Dec.	1	9-15am	E	3	E b N	2	NE
„	3	2am	NW	3	S b E	3	S
„	14	10am	W b S	2	N b E	0	NE
„	17	8-30am	SW	2	WNW	1	W
„	29	9-15am	NW b W	2	NW b W	0	

SUMMARY OF SOLAR OBSERVATIONS.

Number of days of Observation in each Month.

1896.	Recorded Sunshine.	Amount of Sunshine expressed in hours.	Number of Sun Drawings 10½ inches to diameter.	Solar Spectrum Photographs.	
January .....	10	24.6	5	4	
February .....	14	33.8	7	1	
March .....	26	96.0	8	2	
April .....	28	166.6	16	15	
May .....	29	239.0	21	40	
June .....	30	210.6	13	25	
July .....	30	191.1	19	26	
August .....	30	114.7	2	2	
September ...	25	62.9	7		
October .....	24	81.8	9	7	
November ...	19	60.0	10	16	
December ...	11	17.8	8	1	
Totals .....	276	1298.9	125	139	

1896.	January	February	March	April	May	June	July	August	September	October	November	December
1			.46	.50	.45	.38	.73	.42			.40	.45
2				.44							.39	
3					.42	.52	.77				.37	
4				.66	.38		.35				.39	
5					.44		.34				.38	
6					.33	.71	.40					
7					.35	.39				.35	.40	
8	.43			.66	.39		.65	.45	.45			
9		.48		.38	.47	.67	.51					
10			.69		.43		.35	.47		.41		
11			.44	.87	.36	.45	.34			.40	.40	.42
12		.41	.40		.35	.49	.66			.40		
13				.39		.43	.34					
14					.49		.39					
15					.35		.68	.35			.52	.47
16				.73	.49							.45
17				.34	.49	.44	.39				.39	.41
18	.43	.56		.53	.43		.39			.36		
19				.37	.52		.34		.70	.51		
20					.43	.46	.38		.42			
21		.66			.43							
22	.65	.65										
23	.44	.44			.85	.46	.70	.69		.39		.45
24			.31	.42		.69						
25				.44								
26		.52		.69	.52	.42						
27					.39	.52	.42		.52	.49		.48
28	.42		.46	.44	.71							
29			.39	.42	.74		.46		.44	.42	.37	.48
30												
31							.46					

## TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January -	0	0	0	0	0	0	0	1.6	0	1.0	0	0	0.8	2.8	0.7	0	0
February -	0	0	0	0	0.2	0.1	1.8	0	6.2	0	1.2	0	0.5	1.3	0	0	0
March -	4.5	0.1	3.7	4.2	3.7	0	0	0	1.8	0.5	2.8	7.3	0	4.8	2.1	2.8	1.9
April -	6.7	9.6	1.2	0	2.2	4.4	3.5	1.1	5.8	9.6	5.8	8.4	10.2	0	11.2	0.8	8.8
May -	7.3	0.1	5.2	7.0	10.2	14.0	9.4	13.8	13.4	14.3	13.9	13.3	10.7	10.2	3.0	0	7.5
June -	10.8	4.9	1.3	2.3	8.6	4.2	1.4	3.8	3.8	4.5	8.8	3.1	9.2	12.4	12.8	8.2	2.4
July -	5.3	7.4	2.6	2.0	13.6	10.8	5.2	1.5	0	8.0	7.9	11.1	12.7	5.5	2.2	14.2	8.4
August -	9.2	1.2	3.5	0.6	3.0	10.2	3.7	4.5	2.2	6.0	4.4	0.7	1.4	3.4	6.7	10.2	3.6
September -	5.4	0.4	0.8	0.1	0	0	2.4	2.7	0	3.6	0.6	0	2.2	0.8	0.8	2.0	2.4
October -	0	0	0.4	0.5	4.3	0	0	4.8	7.2	0.6	0.8	9.3	8.0	6.2	0.7	3.8	3.3
November -	1.8	3.0	6.3	5.4	3.2	4.8	0	6.2	7.0	0	0	1.0	0	0	1.9	0.5	4.2
December -	0	0	0.4	0	0	0	0	0	0	0	1.2	0	1.0	0	0	0	2.4

# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY. (Continued.)

MONTH.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Per centage each month.
January -	2.8	4.5	0	0	3.2	0	0	0	0	0	5.5	2.2	0	0	24.6	9.5
February -	0	0.8	0	2.8	2.2	8.8	4.0	0	3.5	0	0.4	0	0	0	33.8	11.7
March -	1.2	0	4.0	3.9	0.8	7.4	2.7	0.5	3.0	8.7	4.9	9.7	8.6	0.4	96.0	26.2
April -	10.9	5.0	0.9	6.4	4.2	5.6	9.2	6.9	6.1	1.5	6.6	9.2	4.8	0	166.6	40.1
May -	2.3	9.0	5.8	9.5	0	3.9	6.6	6.8	7.0	9.0	9.4	4.2	4.8	7.4	239.0	49.6
June -	11.4	12.3	7.4	10.6	12.2	5.0	9.4	3.8	11.7	0.3	11.0	7.3		0	210.6	42.6
July -	0.4	11.8	11.7	6.7	7.0	7.4	0.2	0.3	3.7	3.3	10.7	1.6	1.5	6.4	191.1	38.5
August -	8.2	3.9	1.5	5.8	1.5	0.3	6.4	5.6	2.7	0.5	0.2	1.8	2.8	0	114.7	25.6
September -	1.3	7.7	8.2	3.1	0.2	0.2	2.1	0.6	0	0.5	8.2	1.8	5.3	0	62.9	16.7
October -	0.9	0	7.6	7.5	0.4	3.8	0.7	0	0.8	0	1.4	2.0	5.8	2.0	81.8	24.8
November -	0.7	3.8	3.7	0	0	0	0	0	2.0	0.1	0	2.1	2.8	0	60.0	22.8
December -	1.1	4.9	1.0	1.5	0	0	0	0.2	0	3.8	0.3	0	.0	0	17.8	7.4

## MONTHLY TABLES FOR EACH HOUR OF RECORDED SUNSHINE

Local apparent time.	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9
January - -	0	0	0	0	0	2.0	3.8	5.0	5.3	5.0	2.5	1.0	0	0	0	0	0
February - -	0	0	0	0.5	1.0	2.9	4.0	4.9	5.8	5.4	5.5	3.4	0.4	0	0	0	0
March - -	0	0	1.7	5.3	9.5	11.5	10.4	11.2	9.5	8.9	10.1	8.7	6.9	2.3	0	0	0
April - -	0	0	4.6	10.3	12.5	15.1	15.7	15.5	14.3	16.1	17.2	15.7	16.9	11.1	1.6	0	0
May - -	0.4	8.9	12.6	16.8	19.4	20.3	17.3	19.0	19.8	19.6	20.6	17.7	17.4	15.4	12.0	1.8	0
June - -	0.9	6.6	10.9	12.8	15.0	16.6	17.7	17.9	19.0	18.0	17.0	16.5	15.4	12.7	10.7	2.9	0
July - -	0.8	7.2	13.0	12.9	14.5	12.9	13.4	15.2	15.0	16.6	14.4	14.0	13.3	13.6	10.5	3.8	0
August - -	0	0.4	3.9	7.4	7.4	7.6	7.2	6.1	11.5	12.5	11.5	13.0	11.5	10.5	3.9	0.3	0
September - -	0	0	0	3.6	5.4	4.5	9.0	8.6	7.3	5.8	6.4	6.5	4.7	1.1	0	0	0
October - -	0	0	0	1.5	6.5	8.9	8.9	10.3	10.6	11.4	11.3	8.5	3.9	0	0	0	0
November - -	0	0	0	0.8	1.5	5.0	11.1	11.8	10.6	9.7	6.5	3.5	0	0	0	0	0
December - -	0	0	0	0	0	1.7	4.2	2.9	2.1	3.9	3.0	0	0	0	0	0	0
Total - -	2.1	23.1	46.7	71.4	92.7	109.0	122.7	128.4	130.8	132.9	126.0	108.5	90.4	66.7	38.7	8.8	0

## OBSERVATIONS OF UPPER CLOUDS (CIRRUS.)

Date. 1896.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds
		Direction	Velocity (0—6).	Direction.	Force. (0—12)	
January 19	10am	SW	2	WSW	1	
„ 20	10am	NW	2	N b W	0	
„ 29	10am	SW b S	3	W b S	0	SWb W
February 7	2pm	W b N	2	SSW	2	SW
„ 11	Noon	SE b S	3	W b S	3	W
„ 13	9am	SE b S	2	NE b N	1	NW
„ 14	1-30pm	E b S	2	W	3	W
„ 24	9-10am	N b W	2	E b N	1	
„ 26	Noon	N	3	SE	0	
March 5	9am	NW b N	3	WNW	4	W
„ 12	9am	E b S	2	ENE	1	NE
„ 22	9-10am	N b W	2	W	0	S
„ 23	9 15am	NNW	2	SW b W	2	SW
„ 27	10-55am	WNW	2	WNW	5	NW
„ 30	7-45am	N b W	2	NNE	1	
April 2	10am	N	2	N	1	NNE
„ 3	5-20pm	N	3	ENE	1	
„ 6	4pm	NW	1	W	3	W
„ 9	9-30am	N b W	2	WSW	2	W
„ 13	9am	NW	2	NW b W	3	NWb W
„ 17	6-30pm	W	3	W	3	SWb W
„ 18	10am	WNW	2	ESE	0	NW
„ 24	4pm	NW b W	2	W	2	SW
„ 27	4-30pm	W	3	W b S	4	SWb W
May 5	1-45pm	NW	3	WNW	2	W
„ 6	8-30am	NNE	2	ENE	2	
„ 7	5-45pm	NNW	3	ENE	2	W
„ 8	9-30am	NE b N	2	E b N	2	
„ 13	10 50am	SE	2	WSW	2	W
„ 16	9-15am	W b N	2	NE b E	0	W
„ 19	7-30am	W b S	3	WNW	2	W
„ 20	Noon	SE b S	3	N b W	5	NW
„ 21	7-30am	N b E	2	N b W	1	NW
„ 27	7-15am	SE b E	3	NE b E	1	NE
„ 28	10-30am	WNW	2	E	1	NE
„ 29	11-45am	NW	3	NW	5	W
June 1	5-30pm	NW	3	NNW	0	W
„ 2	9am	W	2	NNE	1	
„ 6	8-30am	E b S	2	SSE	1	SE
„ 8	4pm	S	3	N	1	NW

OBSERVATIONS OF UPPER CLOUDS (*Continued*).

Date. 1896.		G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
			Direction.	V'locity (0—6).	Direction.	Force. (0—12)	
June	9	9am	SW b S	2	NE b E	1	NE
"	10	3-30pm	NNW	2	N b W	2	N
"	12	7am	SW	3	NW b W	0	
"	13	7-45am	S	2	NW	0	SW
"	14	9-30am	S b W	2	E b N	0	NW
"	16	Noon	SW b W	3	ESE	2	W
"	18	2pm	SW	3	W b S	3	W
"	19	4pm	W	3	W	3	W b S
"	22	9am	NW	3	WNW	2	W
"	28	Noon	W	3	WNW	4	SW
"	30	5-20pm	NW	2	WNW.	4	W
July	2	Noon	NW b W	3	W	2	NW
"	5	10am	NW b W	2	W b S	3	W
"	6	9am	S	2	W	1	SW
"	7	9am	S b W	2	WSW	1	SW
"	12	5pm	W	2	WNW	2	W
"	13	8-30am	NW	2	NNE	0	S b E
"	14	2pm	SSE	2	W	2	SW
"	16	3pm	NE	2	NE	1	SW
"	17	5-30pm	NW	2	W b N	1	
"	19	2pm	NW	2	W	3	SE
"	23	2pm	SW	3	W b S	4	SW
August	6	2pm	SW	2	W	3	W
"	9	5pm	SW	3	NE	1	NW
"	10	7-30pm	NE	3	NE b E	1	W
"	11	5pm	NW	2	W	3	W
"	12	5pm	NW	3	W b N	3	W
"	15	6-30pm	W b N	3	NW	1	NW
"	16	9am	NW b N	2	WSW	2	W
"	17	5pm	N b W	3	SW b W	1	S
"	18	3pm	S	2	W	3	W
"	20	7pm	NE	3	SW b W	1	SW
"	24	4-30pm	NW	1	W b S	3	W
Sept.	1	7-30am	ESE	2	N b E	0	N b W
"	1	Noon	E b S	2	NW b N	1	NW
"	9	4pm	NW	2	ENE	1	NE
"	10	4pm	NNW	2	ESE	1	NE
"	15	4pm	W b S	3	S	2	SW
"	18	9am	W	2	SW b W	2	SW
"	18	10am	SW b W	2	WSW	2	SW
"	18	10-30am	SW	3	WSW	2	SW
"	23	5-45pm	NW	2	WNW	6	W



OBSERVATIONS OF UPPER CLOUDS (*Continued*).

Date. 1896.	G M.T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	V'locity (0—6.)	Direction.	Force. (0—12.)	
Sept. 24	5-50pm	W	3	SW b W	1	SW
„ 30	Noon	N	3	WSW	1	W
Oct. 7	7am	NW	3	SW	1	SW
„ 12	7-30am	NNW	3	N	2	NE
„ 17	8-30am	NE b W	3	NNE	1	
„ 21	8am	NW b W	2	NNE	1	NE
„ 22	8am	N b W	3	S b E	0	SW
„ 26	2pm	W b S	3	NW b N	1	NW
„ 28	9am	NW b W	2	NW b W	0	
„ 28	2pm	NW	2	SW b W	1	NE
„ 29	8-30am	ENE	2	ENE	0	NE
Nov. 2	7-30am	NW	3	N b E	1	
„ 3	8am	WNW	3	NNE	1	NE b N
„ 4	9am	N b W	2	NNW	1	NW
„ 6	10am	N	2	NNE	0	NE
„ 11	4pm	N	2	WSW	2	WSW
„ 17	Noon	NW b N	2	NE b N	0	NE
„ 17	2pm	N	3	NE b N	0	NE
„ 19	Noon	NNW	2	SW	1	SW
„ 27	8-30am	E	2	ENE	1	NE
Dec. 1	9-15am	E	3	E b N	2	NE
„ 3	2am	NW	3	S b E	3	S
„ 14	10am	W b S	2	N b E	0	NE
„ 17	8-30am	SW	2	WNW	1	W
„ 29	9-15am	NW b W	2	NW b W	0	

## OBSERVATIONS OF EARTH-MAGNETISM.

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ABSOLUTE measures of Horizontal Magnetic Force have been made once each month, by the method of Vibration and Deflection.

In these observations the same Magnet has been employed from the beginning of the series in March. 1863. The weight of the Magnet with its stirrup is 825 grains, and its length 3.94 inches nearly. Its moment of inertia, measured by the method of vibrations, with and without a known increase of the moment, is 5.27303 to the English foot—second—grain units, at the temperature 35° Fahr., and its rate of increase is 0.00073 for increase of 10°

The temperature corrections have been obtained from the formula  $q(t^\circ - 32^\circ) + q'(t^\circ - 32^\circ)^2$ , where  $t^\circ$  is the observed temperature and 32° Fahr. the adopted standard temperature. The values of the co-efficient  $q$  and  $q'$  are respectively 0.0001128 and 0.000000486.

The induction co-efficient  $\mu$  is 0.000244.

The correction for error of graduation of the Deflection bar at 1.0 foot is + 0.00004 ft. at 1.3 + 0.000064 ft.

The observed times of vibration are entered in the Table without corrections.

The time of one vibration has been obtained each month from the mean of twelve determinations of the time of 100 vibrations.

The angles of deflection are each the mean of two sets or readings.

In deducing from these observations the ratio and product of the magnetic moment  $m$  of the magnet, and the earth's horizontal magnetic intensity  $X$ , the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread; but no correction has been required for the rate of the chronometer, or for the arc of vibration, the former having been always under 1.5s and the latter never over 50'.

The average deflection of the magnet caused by a twist of the torsion circle through 90° has been about 12'.2 of arc.

In the calculations of the ratio  $\frac{m}{X}$ , the third and subsequent

terms of the series  $1 + \frac{P}{r^2} + \frac{Q}{r^4} + \&c.$ , have always been omitted.

The value of the constant  $P$  was found to be  $-0.00055$ .

The Vertical and Total Forces are deduced from the measures of the Horizontal Force, and the Angle of Inclination or Dip.

All the computations are in English foot—second—grain units ; and in the final table the results are given also in C. G. S units, in parallel columns.

The Dip, or angle between the direction of total force, and that of its horizontal component, has been measured with Barrow's Circle, once each month by two needles, always when possible on the days of vibration and deflection observations.

The Declination has been observed at the beginning of each week, usually on Mondays at 4 p.m and is quoted as the angle between the horizontal direction of force and the Astronomical Meridian, measured from the North Point.

The Differential Instruments, or Photo-Magnetographs, are of the same pattern as those at the Kew Observatory, except that the radial distances between the centres of the magnets and the surfaces of the respective cylinders are shorter, and the clock is not provided with an automatic light-cut-off, for the time scale. The "cut-offs" are made by hand at the hours 0, 2, 20, and 22 of the astronomical day, to furnish two time marks at each end of the day's curves, the changes being made between 10-30 and 11 a.m., civil time.

The scale value of the Bifilar horizontal force torsion balance, has remained very constant at 0.00051 C. G. S. for one centimetre, during the last five years

The scale value of the Unifilar Declination Magnet is  $11' \cdot 28$  arc per centimetre.

The corrections for diurnal range, employed in the tables, are taken from the Kew Reports 1891-95.

## OBSERVATIONS OF DECLINATION AND DIP.

1896 MONTH	G.M.T. CIVIL DAY	WEST DECLINATION		Needle	MAGNETIC DIP.	
		Observations.	Monthly Mean.		DIP.	G.M.T. CIVIL DAY
	D. H. M.	° ' "	° ' "		° ' "	D. H. M.
Jan.	6 16 10	18 29 7	18 31.9	1 3	68 55.3 69 3.4	20 11 48 ,, 12 15
	13 16 8	18 31.2				
	20 16 0	18 33.7				
	27 16 0	18 33.0				
Feb.	4 16 0	18 37.0	18 33.5	1 3	68 56.1 69 2.1	25 15 43 ,, 16 20
	10 16 0	18 28.9				
	17 16 0	18 33 7				
	24 16 0	18 34 4				
March	2 16 0	18 34.2	18 34.5	1 3	68 54.1 69 2.6	20 10 55 ,, 11 28
	9 16 0	18 34.7				
	16 16 0	18 31.2				
	26 16 0	18 36.5				
April	30 16 0	18 36 1	18 33.9	1 3	68 53.4 69 1.9	15 15 55 ,, 16 28
	6 16 0	18 33.4				
	13 16 0	18 33.4				
	20 16 0	18 35.4				
May	27 16 0	18 33.2	18 34.3	1 3	68 53.8 68 58.6	16 11 10 ,, 11 44
	4 16 0	18 33.7				
	11 16 0	18 38.1				
	18 16 0	18 34.2				
June	25 16 0	18 31.1	18 32.0	1 3	68 53.8 69 0 0	15 10 30 ,, 11 18
	1 16 0	18 30.4				
	8 16 0	18 34.4				
	15 16 0	18 31.3				
July	23 16 0	18 31.7	18 31.6	1 3	68 53.8 68 58.6	15 11 15 ,, 11 45
	6 16 0	18 33.4				
	13 16 0	18 33.3				
	20 16 0	18 26.2				
	27 16 0	18 33.5				

## OBSERVATIONS OF DECLINATION AND DIP.

*(Continued.)*

1896 MONTH	G.M.T. CIVIL DAY	WEST DECLINATION		Needle	MAGNETIC DIP.	
		Observations.	Monthly Mean.		DIP.	G.M.T. CIVIL DAY
	D. H. M.	° ' "	° ' "		° ' "	D. H. M.
Aug.	3 16 0	18 31.1	18 30.3	1 3	68 53.4 69 1 9	26 11 0 ,, 11 30
	10 16 0	18 30.3				
	17 16 0	18 30.0				
	24 16 0	18 29.6				
Sept.	1 16 0	18 26.9	18 29.7	1 3	68 52.9 69 2.1	17 11 30 ,, 12 23
	7 16 5	18 28.3				
	14 16 0	18 29.6				
	21 16 5	18 33.5				
	28 16 0	18 30.4				
Oct.	5 16 5	18 30.6	18 28.2	1 3	68 52.5 68 59.8	19 8 5 ,, 8 35
	12 16 0	18 27.5				
	20 16 0	18 26.8				
	26 16 5	18 27.9				
Nov.	2 16 0	18 29.0	18 28.1	1 3	68 57.6 69 1.5	17 11 23 ,, 11 50
	9 16 0	18 26.8				
	16 16 5	18 33.2				
	23 16 0	18 24.1				
	30 16 0	18 27.5				
Dec.	7 16 0	18 23.7	18 26.1	1 3	68 57.5 68 59.5	14 11 15 ,, 11 45
	14 16 0	18 28.2				
	21 16 15	18 27.2				
	29 16 0	18 25.2				
Yearly Mean			18 31.2		68 57.7	

## OBSERVATIONS OF VIBRATIONS AND DEFLECTIONS

Month.	(Civil Day).	Temp.	of one vibration	G. M. T	Temp.	Deflection at 1.0 ft. at 1.3 ft.
	D. H. M.	°		D. H. M.	°	°
Jan.	20 9 49	42.5	5 9854	20 { 10 45 10 44	42.0	12 2.0 12 2.0
Feb.	25 9 56	34.0	5 9707	25 { 11 50 11 49		
Mar.	18 9 26	41.8	5 9793	18 { 10 40 10 44		
Apr.	15 10 7	45.5	5 9788	15 { 10 18 10 19		
May	16 9 18	52.6	5 9805	16 { 10 14 10 14		
June	15 8 20	63.2	5 9886	15 { 9 41 9 48		
July	15 9 33	63.0	5 9864	15 { 10 23 10 32		
Aug.	26 8 40	51.1	5 9839	26 { 10 0 9 58		
Sept.	17 9 20	59.1	5 9918	17 { 10 14 10 15		
Oct.	17 10 57	55.8	5 9867	17 { 11 47 11 45		
Nov.	17 9 20	40.0	5 9765	17 { 10 33 10 34		
Dec.	14 9 30	39.0	5 9844	14 { 10 20 10 20		

## MAGNETIC INTENSITY.

BRITISH UNITS.				C. G. S. UNITS.		
1896	Horizon- tal force.	Vertical force.	Total Force.	Horizontal Force.	Vertical Force.	Total Force.
Jan. ..	3·7246	9·6974	10·3880	0·1717	0·4471	0·4790
Feb. ..	3·7324	9·7161	10·4084	0·1721	0·4480	0·4799
Mar. ..	3·7302	9·7036	10·3959	0·1720	0·4474	0·4793
April ..	3·7325	9·7036	10·3966	0·1721	0·4474	0·4794
May ..	3·7301	9·6853	10 3787	0·1720	0·4466	0·4785
June ..	3·7283	9·6864	10·3792	0·1719	0·4466	0·4786
July ..	3·7303	9·6857	10·3792	0·1720	0·4466	0·4786
Aug. ..	3·7301	9·6973	10·3900	0·1720	0·4471	0·4791
Sept. ..	3·7249	9·6828	10·3746	0·1718	0·4465	0·4784
Oct. ..	3·7313	9·6882	10·3818	0·1720	0·4467	0·4788
Nov. ..	3·7397	9·7385	10·4318	0·1724	0 4490	0·4810
Dec. ..	3·7350	9·7172	10 4102	0·1722	0·4480	0·4800
Means	3·7308	9·7002	10·3929	0·1720	0·4473	0·4792





# HORIZONTAL MAG

horizontal Magnetic Force in C. G. S. units (fr

The figures in the columns are en

	Mean of the highest daily readings.	Mean of the lowest daily readings.	Means of s and b.	Means of daily readings 4a m. & 4p
	(a)	(b)	(c)	(d)
	17000 +			
-	257	181	219	225
-	270	187	229	227
-	266	191	229	235
-	272	191	232	239
-	273	172	223	231
-	269	196	233	233
-	268	180	224	225
-	250	168	207	220
-	250	153	204	216
-	251	185	218	220
-	245	198	222	226
-	246	204	225	227
-	260	184	222	227
Correction for diurnal range				-4
Mean Horizontal Force for the year				0.17223



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<b>Beobachtungen des Tiflisser Physikalischen Observatoriums im Jahre 1894</b>	- - - - -	Das Observatorium
<b>Beobachtungen der Temperatur des Erdbodens im Tiflisser Physikalischen Observatorium im Jahre 1890</b>	-	„
<b>Untersuchungen über die Spectra der Metalle in Electrischen Flammenbogen II. Spectrum des Titans von B Hasselberg</b>	- - - - -	Der Verfasser
<b>Untersuchungen über die Spectra der Metalle im Electrischen Flammenbogen III. Cobalt und Nickel Von Demselben</b>	- - - - -	„
<b>Über das Spectrum von Mira Ceti, von H. C Vogel</b>	- - - - -	„
<b>Die Lichtabsorption als maassgebender Factor bei der Wahl der Dimension des Objectivs für den grossen Refractor des Potsdamer Observatoriums, Von Demselben</b>	- -	„
<b>Ergebnisse der Meteorologischen Beobachtungen im Reichsland Elsass-Lothringen im Jahre 1894, von Dr. Hugo Hergesell</b>	- - - - -	„
<b>Zur Bestimmung der Rotationszeit der Sonne, Von A. Wolfer</b>	- -	„
<b>Magnetische Beobachtungen in der Schweiz im Jahre, 1895, ausgeführt durch Dr Van Rijckervorsel und Dr. W. Van. Bemmelen</b>	- -	Der Verfasser
<b>A Kis-Kartali Csillagda Tevékenysége, 1893, Októbertől, 1895, Októberig Irta Wonaszek A. Antal</b>	- -	„



APPENDIX  
RESULTS

OF

METEOROLOGICAL OBSERVATIONS

TAKEN AT

ST. IGNATIUS' COLLEGE, MALTA

BY THE

REV. J. F. DOBSON, S.J.

1896.

# ST. IGNATIUS' COLLEGE, MALTA.

Lat 35° 55' N.      Long. 14° 29' E.      Barometer Readings  
reduced to 32° F. at sea level.

## METEOROLOGICAL REPORT. JANUARY, 1896.

Result of Observations taken during the Month.		Mean for the last 13 years
Mean Reading of the Barometer ....inches	30·081	30·030
Highest                   ,,                   on the 30th..   ,,	30·597	30·408
Lowest                   ,,                   on the 10th   ,,	29·718	29·559
Range of Barometer Readings .....	0·879	0·849
Highest Reading of a Max. Therm. on the 1st	64·0	65·1
Lowest Reading of a Min. Therm. on the 21st	40·1	41·4
Range of Thermometer Readings .....	23·9	23·7
Greatest Range in 24 hours on the 4th .....	18·8	18·4
Mean of all the Highest Readings .....	58·3	59·0
Mean of all the Lowest Readings .....	48·0	48·3
Mean Daily Range .. .....	10·3	10·7
Mean Temperature (deduced from Max. & Min.)	52·4	53·0
Mean Temperature (deduced from Dry Bulb)	51·8	52·7
Adopted Mean Temperature.....	52·1	52·9
Mean Temperature of Evaporation.....	46·6	48·5
Mean Temperature of Dew Point .....	41·5	45·4
Mean elastic force of Vapour .....inches	0·262	0·304
Mean weight of Vapour in a cub. ft. of air grains	3·1	3·5
Mean additional weight required for saturation	1·0	0·9
Mean degree of Humidity .....	75	80
Mean weight of a cubic foot of air....grains	544·2	542·2
Fall of Rain .....	3·050	3·730
Number of days on which Rain fell .....	15	14
Mean amount of Cloud (an overcast sky=10)	6·2	5·3
Total number of miles of Wind indicated....	9205	8384
Mean Velocity of Wind per hour .....miles	12·4	11·2

## FEBRUARY, 1896.

Results of Observations taken during the Month.	Mean for the last 13 years.
Mean Reading of the Barometer . . . . . inches 30·183	30·020
Highest                    „            on the 18th    „    30·488	30·317
Lowest                    „            on the 25th   „    29·633	29·630
Range of Barometer Readings . . . . . „    0·855	0·687
Highest Reading of a Max. Ther. on the 15th & 27th 63·8	67·3
Lowest Reading of a Min. Therm. on the 18th 40·1	41·2
Range of Thermometer Readings . . . . . 23·7	26·1
Greatest Range in 24 hours on the 27th . . . . . 20·2	19·4
Mean of all the Highest Readings . . . . . 60·2	60·2
Mean of all the Lowest Readings . . . . . 51·3	49·1
Mean Daily Range . . . . . 8·9	1·1
Mean Temperature (deduced from Max. & Min ) 54·7	53·7
Mean Temperature (deduced from Dry Bulb) 53·4	54·0
Adopted Mean Temperature . . . . . 54·1	53·9
Mean Temperature of Evaporation . . . . . 49·3	49·6
Mean Temperature of Dew Point . . . . . 46·8	46·7
Mean elastic force of Vapour . . . . . inches 0·321	0·320
Mean weight of Vapour in a cub. ft. of air grains 3·6	3·6
Mean additional weight required for saturation,, 0·7	0·8
Mean degree of Humidity . . . . . 84	82
Mean weight of a cubic foot of air . . . . grains 544·4	540·6
Fall of Rain . . . . . inches 1·907	2·163
Number of days on which Rain fell . . . . . 9	9
Mean amount of Cloud (an overcast sky = 10) 6·3	4·9
Total number of miles of Wind indicated . . . . 6607	7920
Mean Velocity of Wind per hour . . . . . miles 9·5	11·7

# MARCH, 1896.

Results of Observations taken during the Month.			Mean for the last 13 years.
Mean Reading of the Barometer..... inches	29.991		29.995
Highest                   ,,                   on the 17th                   ,,	30.317		30.351
Lowest                   ,,                   on the 30th                   ,,	29.645		29.526
Range of Barometer Readings .....	0.672		0.725
Highest Reading of a Max. Therm. on the 29th	68.7		74.1
Lowest Reading of a Min. Therm. on the 13th	46.2		42.8
Range of Thermometer Readings .....	22.5		21.3
Greatest Range in 24 hours on the 3rd .....	21.4		22.8
Mean of all the Highest Readings .....	63.6		63.1
Mean of all the Lowest Readings .....	54.1		50.7
Mean Daily Range.....	9.5		12.4
Mean Temperature (deduced from Max. & Min.)	58.1		56.1
Mean Temperature deduced from Dry Bulb)	55.9		55.2
Adopted Mean Temperature.....	57.0		55.7
Mean Temperature of Evaporation .....	52.8		51.6
Mean Temperature of Dew Point .....	50.1		48.3
Mean elastic force of Vapour ..... inches	0.362		0.340
Mean weight of Vapour in a cub.ft. of air grains	4.1		3.8
Mean additional weight required for saturation,,	0.9		1.1
Mean degree of Humidity .....	82		78
Mean weight of a cubic foot of air .... grains	536.6		537.4
Fall of Rain .....	1.026		1.040
Number of days on which Rain fell .....	8		7
Mean amount of Cloud (an overcast sky = 10)..	6.3		4.5
Total number of miles of Wind indicated ..	8967		8087
Mean Velocity of Wind per hour..... miles	12.1		11.7



## APRIL, 1896.

Results of observations taken during the Month.		Mean for the last 13 years.
Mean Reading of the Barometer . . . . inches	30·010	29·942
Highest                   ,,           on the 18th   ,,	30·219	30·254
Lowest                   ,,           on the 2nd   ,,	29·662	29·533
Range of Barometer Readings . . . . .	0·557	0·721
Highest Reading of a Max. Therm. on the 21st	67·2	77·0
Lowest Reading of a Min. Therm. on the 9th	44·6	48·1
Range of Thermometer Readings . . . . .	22·6	28·9
Greatest Range in 24 hours on the 21st . . . .	20·2	21·9
Mean of all the Highest Readings . . . . .	63·0	67·5
Mean of all the Lowest Readings . . . . .	51·2	54·3
Mean Daily Range . . . . .	11·8	13·2
Mean Temperature (deduced from Max. & Min.)	56·1	60·0
Mean Temperature (deduced from Dry Bulb)	56·3	59·7
Adopted Mean Temperature . . . . .	56·2	59·8
Mean Temperature of Evaporation . . . . .	52·3	55·8
Mean Temperature of Dew Point . . . . .	48·5	52·4
Mean elastic force of Vapour . . . . . inches	0·342	0·394
Mean weight of Vapour in a cub. ft. of air grains	3·9	4·4
Mean additional weight required for saturation,,	1·2	1·3
Mean degree of Humidity . . . . .	75	78
Mean weight of a cubic foot of air grains	536·3	531·4
Fall of Rain . . . . . inches	3·342	0·735
Number of days on which Rain fell . . . . .	11	5
Mean amount of Cloud (an overcast sky=10)	6·5	4·4
Total number of miles of Wind indicated . . . .	9430	8186
Mean Velocity of Wind per hour . . . . . miles	13·1	11·4

## MAY, 1896.

Results of Observations taken during the Month.			Mean for the last 13 years.
Mean Reading of the Barometer	.... inches	29·937	29·990
Highest	„ on the 11th „	30·145	30·184
Lowest	„ on the 19th „	29·717	29·626
Range of Barometer Readings.....	„	0·428	0·558
Highest Reading of a Max. Therm. on the 22nd†		77·5	82·1
Lowest Reading of a Min. Therm. on the 14th		52·3	53·6
Range of Thermometer Readings .....		25·2	28·5
Greatest Range in 24 hours on the 16th.....		22·2	23·6
Mean of all the Highest Readings.....†		69·7	72·7
Mean of all the Lowest Readings .....		57·0	58·6
Mean Daily Range .....		12·7	14·1
Mean Temperature (deduced from Max. & Min)		62·4	64·5
Mean Temperature (deduced from Dry Bulb)		61·7	64·0
Adopted Mean Temperature .....		62·1	64·3
Mean Temperature of Evaporation .....		58·5	60·2
Mean Temperature of Dew Point .....		55·2	56·6
Mean elastic force of Vapour .....	inches	0·436	0·460
Mean weight of Vapour in a cub. ft. of air	grains	4·9	5·0
Mean additional weight required for saturation,,		1·4	1·7
Mean degree of Humidity.....		78	76
Mean weight of a cubic foot of air....	grains	528·3	526·8
Fall of Rain.....	inches	1·021	0·637
Number of days on which Rain fell .....	†	7	3
Mean amount of Cloud (an overcast sky=10)†		6·1	3·9
Total number of miles of wind indicated ....		8073	7306
Mean Velocity of Wind per hour .....	miles	10·8	9·8
† Lowest reading. ‡ Highest reading yet recorded for this month.			

## JUNE, 1896.

Results of Observations taken during the Month		Mean for the last 13 years.
Mean Reading of the Barometer .....	inches 30·020	30·015
Highest ..	on the 12th ,, 30·095	30·181
Lowest ..	on the 28th ,, 29·619	29·818
Range of Barometer Readings.....	,, 0·476	0·363
Highest Reading of a Max. Ther. on the 25th ..	89·5	90·3
Lowest Reading of a Min. Therm. on the 3rd	56·0	58·8
Range of Thermometer Readings .....	33·5	31·5
Greatest Range in 24 hours on the 13th ....	27·1	25·3
Mean of all the Highest Readings .....	82·8	80·4
Mean of all the Lowest Readings .....	66·1	64·7
Mean Daily Range.....	16·7	15·7
Mean Temperature (deduced from Max. & Min.)	73·8	71·8
Mean Temperature (deduced from Dry Bulb)	72·8	71·1
Adopted Mean Temperature .....	73·3	71·5
Mean Temperature of Evaporation .....	68·0	65·9
Mean Temperature of Dew Point .....	* 64·2	61·7
Mean elastic force of Vapour .....	inches 0·601	0·551
Mean weight of Vapour in a cubic ft. of air grains	5·6	6·0
Mean additional weight required for saturation,,	2·3	2·4
Mean degree of Humidity .....	* 78	72
Mean weight of a cubic foot of air .....	grains 517·6	519·8
Fall of Rain .....	inches 0·0	0·074
Number of days on which Rain fell.....	0	1
Mean amount of Cloud (an overcast sky=10)	3·7	2·1
Total number of miles of Wind indicated ..	6105	6279
Mean Velocity of Wind per hour.....	miles 8·5	8·8
* Highest Reading yet recorded for June.		

## JULY 1896.

Results of Observations taken during the Month			Mean for the last 13 years.
Mean Reading of the Barometer . . . . . inches	30·026		30·007
Highest                    „                    on the 9th                    „	30·162		30·146
Lowest                    „                    on the 30th                    „	29·865		29·834
Range of Barometer Readings . . . . . „	0·297		0·312
Highest Reading of a Max. Therm. on the 19th	103·0		97·5
Lowest Reading of a Min. Therm. on the 1st	63·3		64·7
Range of Thermometer Readings . . . . .	39·7		32·8
Greatest Range in 24 hours on the 10th . . . .	31·1		26·9
Mean of all the Highest Readings . . . . .	87·7		86·9
Mean of all the Lowest Readings . . . . .	69·0		69·8
Mean Daily Range . . . . .	18·7		17·1
Mean Temperature (deduced from Max. & Min.)	77·9		77·9
Mean Temperature (deduced from Dry Bulb)	77·3		77·0
Adopted Mean Temperature . . . . .	77·6		77·5
Mean Temperature of Evaporation . . . . .	70·6		70·4
Mean Temperature of Dew Point . . . . .	65·6		65·8
Mean elastic force of Vapour . . . . . inches	0·630		0·635
Mean weight of Vapour in a cub. ft. of air grains	6·8		6·7
Mean additional weight required for saturation,,	3·4		3·4
Mean degree of Humidity . . . . .	66		67
Mean weight of a cubic foot of air . . . . . grains	513·2		513·4
Fall of Rain . . . . . inches	0		0·035
Number of days on which Rain fell . . . . .	0		0
Mean amount of Cloud (an overcast sky=10)	1·5		0·8
Total number of miles of Wind indicated . . . .	5244		5514
Mean Velocity of Wind per hour . . . . . miles	7·0		7·5

## AUGUST, 1896.

Results of Observations taken during the month.	Mean for the last 13 years.
Mean Reading of the Barometer .. inches 30·003	30·013
Highest                   ,,                   on the 31st   ,,   30·153	30·164
Lowest                   ,,                   on the 6th   ,,   29·889	29·859
Range of Barometer Readings ..... ,,   0·264	0·305
Highest Reading of a Max Therm. on the 11th* 104·8	96·3
Lowest Reading of a Min. Therm. on the 31st† 59·4	65·7
Range of Thermometer Readings .....† 45·4	30·6
Greatest Range in 24 hours on the 11th ..... 24·9	26·0
Mean of all the Highest Readings ..... 86·6	87·2
Mean of all the Lowest Readings..... 71·0	70·8
Mean Daily Range..... 15·6	16·4
Mean Temperature (deduced from Max & Min) 78·0	78·2
Mean Temperature (deduced from Dry Bulb) 77·4	78·2
Adopted Mean Temperature ..... 77·7	78·2
Mean Temperature of Evaporation ..... 70·9	71·4
Mean Temperature of Dew Point ..... 66·2	66·8
Mean elastic force of Vapour..... inches 0·644	0·656
Mean weight of Vapour in a cub. ft. of air grains 7·0	7·0
Mean additional weight required for saturation ,, 3·2	3·4
Mean degree of Humidity..... 68	68
Mean weight of a cubic foot of air ....grains 512·8	512·3
Fall of Rain ..... inches 0	0·111
Number of Days on which rain fell ..... 0	1
Mean amount of Cloud (an overcast sky=10)† 2·2	1·0
Total number of miles of Wind indicated .... 7008	5343
Mean Velocity of Wind per hour.....miles 9·4	7·2
* Absolute Highest Reading of 13 years.	
† Lowest Reading for August.	
† Highest Reading for August.	

# SEPTEMBER, 1896.

Results of Observations taken during the Month.			Mean for the last 13 years.
Mean Reading of the Barometer .....	inches	30·010	30·067
Highest	„ on the 16th „	30·173	30·256
Lowest	„ on the 26th „	29·627	29·857
Range of Barometer Readings .....	„	0·546	0·359
Highest Reading of a Max. Therm. on the 5th & 21st		91·1	92·8
Lowest Reading of a Min. Therm. on the 29th		60·6	62·9
Range of Thermometer Readings .....		30·5	29·9
Greatest Range in 24 hours on the 5th .....		24·7	24·0
Mean of all the Highest Readings .....		82·7	83·5
Mean of all the Lowest Readings .....		68·6	68·9
Mean Daily Range .....		14·1	14·6
Mean Temperature (deduced from Max. & Min.)		74·7	75·3
Mean Temperature (deduced from Dry Bulb)		74·6	74·9
Adopted Mean Temperature.....		74·7	75·1
Mean Temperature of Evaporation.....		69·7	69·3
Mean Temperature of Dew Point .....		66·0	65·6
Mean elastic force of Vapour .....	inches	0·639	0·624
Mean weight of Vapour in a cub. ft. of air	grains	6·9	6·7
Mean additional weight required for saturation,,		2·4	2·7
Mean degree of Humidity.. .....		74	72
Mean weight of a cubic foot of air .....	grains	515·9	516·8
Fall of Rain .....	inches	0	1·085
Number of days on which Rain fell .....		0	4
Mean amount of Cloud (an overcast sky=10)		3·8	2·3
Total number of miles of Wind indicated ....		6227	5550
Mean Velocity of Wind per hour .....	miles	8·6	7·7

## OCTOBER, 1896.

Results of Observations taken during the Month.		Mean for the last 18 years
Mean Reading of the Barometer..... inches	30·036	30·047
Highest                   ,,                   on the 16th   ,,	30·249	30·262
Lowest                   ,,                   on the 2nd   ,,	29·794	29·748
Range of Barometer Readings .....	0·455	0·529
Highest Reading of a Max. Therm. on the 2nd	84·1	88·2
Lowest Reading of a Min. Therm. on the 27th	56·6	55·9
Range of Thermometer Readings.....	27·5	32·3
Greatest Range in 24 hours on the 1st .....	18·1	20·0
Mean of all the Highest Readings.....	76·5	77·5
Mean of all the Lowest Readings.....	62·7	64·8
Mean Daily Range .....	13·8	12·7
Mean Temperature (deduced from Max. & Min.)	68·7	70·0
Mean Temperature (deduced from Dry Bulb)	69·4	68·9
Adopted Mean Temperature .....	69·1	69·5
Mean Temperature of Evaporation.....	65·9	64·7
Mean Temperature of Dew Point .....	63·2	61·2
Mean elastic force of Vapour ..... inches	0·580	0·543
Mean weight of Vapour in a cub. ft. of air grains	6·4	5·9
Mean additional weight required for saturation,,	1·5	1·8
Mean degree of Humidity.....	81	76
Mean weight of a cubic foot of air.... grains	522·0	523·0
Fall of rain .....	2·502	2·787
Number of Days on which rain fell .....	4	7
Mean amount of Cloud (an overcast sky = 10)*	6·5	4·2
Total number of miles of Wind indicated ..	5933	6688
Mean Velocity of Wind per hour .... miles	8·0	9·0
* Highest Reading yet recorded for October.		

# NOVEMBER, 1896.

Results of Observations taken during the Month.	Mean for the last 13 years
Mean Reading of the Barometer..... inches*29·956	30·076
Highest                   ,,                   on the 6th   ,, 30·191	30·325
Lowest                   ,,                   on the 16th   ,, 29·603	29·714
Range of Barometer Readings ..... 0·588	0·611
Highest Reading of a Max. Therm. on the 1st† 83·0	76·7
Lowest Reading of a Min. Therm. on the 23rd... 49·4	50·1
Range of Thermometer Readings ..... 33·6	26·6
Greatest Range in 24 hours on the 11th and 23rd*14·8	18·4
Mean of all the Highest Readings..... 69·2	68·9
Mean of all the Lowest Readings..... 58·8	57·7
Mean Daily Range ..... 10·4	11·2
Mean Temperature (deduced from Max. & Min.) 62·9	62·4
Mean Temperature (deduced from Dry Bulb) 62·5	61·8
Adopted Mean Temperature ..... 62·7	62·1
Mean Temperature of Evaporation..... 58·3	57·6
Mean Temperature of Dew Point..... 55·2	54·2
Mean elastic force of Vapour .....inches 0·436	0·420
Mean weight of Vapour in a cub.ft. of air grains 4·8	4·8
Mean additional weight required for saturation,, 1·3	1·3
Mean degree of Humidity ..... 79	79
Mean weight of a cubic foot of air.....grains 529·1	531·9
Fall of Rain .....inches 5·115	3·293
Number of days on which Rain fell.....† 14·0	10
Mean amount of Cloud (an overcast sky=10)† 7·1	5·2
Total number of miles of Wind indicated ... 7767	6638
Mean Velocity of Wind per hour.....miles 10·8	9·2
* Lowest.	
† Highest yet recorded for November.	



## DECEMBER, 1896.

Results of Observations taken during the Month.	Mean for the last 13 years.
Mean Reading of the Barometer .... inches 29·970	30·041
Highest                   "                   on the 9th 30·333	30·384
Lowest                   "                   on the 21st 29·499	29·580
Range of Barometer Readings ..... 0·884	0·804
Highest Reading of a Max. Therm. on the 7th 68·6	68·7
Lowest Reading of a Min. Ther. on the 2nd .... 43·6	43·7
Range of Thermometer Readings ..... 25·0	25·0
Greatest Range in 24 hours on the 2nd ..... 19·9	17·4
Mean of all the Highest Readings ..... 62·3	61·8
Mean of all the Lowest Readings ..... 52·3	52·3
Mean Daily Range ..... 10 0	9·5
Mean Temperature (deduced from Max & Min) 56·8	56·4
Mean Temperature (deduced from Dry Bulb) 56·2	56·1
Adopted Mean Temperature ..... 56·5	56·3
Mean Temperature of Evaporation..... 52·6	51·9
Mean Temperature of Dew Point ..... 50·1	48·6
Mean elastic force of Vapour ..... inches 0·362	0 342
Mean weight of Vapour in a cub. ft. of air grains 4·0	3·9
Mean additional weight required for saturation,, 0·9	1·1
Mean degree of Humidity ..... 82	79
Mean weight of a cubic foot of air .... grains 536·5	538·4
Fall of Rain ..... inches 3·989	4·209
Number of days on which Rain fell ..... 11	15
Mean amount of Cloud (an overcast sky=10) 6·8	5·7
Total number of miles of wind indicated ..... 8506	8269
Mean Velocity of ind per hour ... .....miles 11·4	11·2

## Summary of Observations FOR 1896

Results of Observations taken during the Year.		Mean for the last 18 years.
Mean Reading of the Barometer .... inches	30 018	30 022
Highest                   ,,           on January 30th ,,	30 597	30 486
Lowest                   ,,           on Decem. 21st ,,	29 499	29 372
Range of Barometer Readings .....	1 098	1 114
Highest Reading of Max. Ther. on Aug. 11	104 8	99 4
Lowest Reading of a Min. Therm. on Jan. 21st*	40 1	40 3
Range of Thermometer Readings .....	64 7	59 1
Greatest Range in 24 hours on July 10th....	31 1	28 7
Mean of all the Highest Readings .....	71 9	72 5
Mean of all the Lowest Readings .....	59 2	59 3
Mean Daily Range.....	12 7	13 2
Mean Temperature (deduced from Max. & Min.)	64 7	65 0
Mean Temperature (deduced from dry bulb)	64 1	64 5
Adopted Mean Temperature .....	64 4	64 8
Mean Temperature of Evaporation .....	69 6	59 8
Mean Temperature of Dew Point .....	56 0	56 2
Mean elastic force of Vapour ....., inches	0 468	0 455
Mean weight of Vapour in a cub. ft. of air grains	5 1	5 1
Mean additional weight required for saturation,,	1 7	1 8
Mean degree of Humidity.....	77	76
Mean weight of a cubic foot of air grains....	529 7	527 8
Fall of rain ....., inches	21 952	19 528
Number of Days on which rain fell.....	79	77
Mean amount of Cloud (an overcast sky=10)	5 2	3 7
Total Number of Miles of Wind indicated ...	89072	88988
Mean Velocity of Wind per hour .....miles	10 1	9 6
* And 18th February.		

SINCE MAY, 1883.

The Maximum monthly mean height of the Barometer was  
in November, 1889, and was ..... inches 30 249  
The Minimum           ,,           ,, in January, 1886, and was 29 844

The Maximum yearly mean height of the Barometer was in 1884, and was .....	inches	30·057
The Minimum ,, ,, in 1890, and was .....		29·996
The greatest monthly range of the Barometer was in January, 1886, and was .....		1·201
The least ,, ,, in August, 1883, and was .....		0·188
The highest reading of the Barometer was on January 26th, 1887, and was .....		30·627
The lowest ,, ,, on January 17th, 1886, and was .....		29·155
Extreme range .....	inches	1·472
The highest temperature was on August 11th, 1896, and was ..		104·8
The lowest ,, ,, February 19th, 1895.....		84·2
The highest mean temperature of a month, was in August, 1885, and was .....		83·2
The lowest ,, ,, ,, February, 1891, ..		49·8
The greatest monthly mean weight of vapour } in a cubic foot of air .....	August, 1885	7·9
The least ,, ,, January and February, 1891, and was grs		3·0
The highest observed Dew point was on August 30th, 1885, and was .....		78·7
The lowest ,, ,, February 19th, 1895, and was .....		27·9
The greatest fall of rain in a month, was in December, 1889, and was .....	inches	8 952
The greatest number of days on which } rain fell in one month .....	January, 1889 ..	24
The greatest fall of rain in a year was in 1889 and was .....	inches	26·044
The smallest ,, ,, ,, 1895 ,, ,, .....		11 384
The greatest number of rainy days in a year was in 1894 and was ..		90
The least ,, ,, ,, 1888 ,, ..		59
The highest temperature registered in sunshine was on the 5th July, 1895, and was .....		159·0
The lowest temperature registered on ground was on the 19th February, 1895, and was .....		31·7
The highest observed sea temperature was on the 5th August, 1887, and was.....		85·0
The lowest ,, ,, 30th January, 1895, and was .....		55·5
The smallest mean amount of cloud observed in one month was in August, 1890. and was .....		0·0
The greatest ,, ,, in January, 1894, and was .....		7·2

## NOTES FOR THE SEPARATE MONTHS.

---

### JANUARY.

THE Dew point ranged between  $54.9^{\circ}$  on the 1st, and  $32.2^{\circ}$  on the 8th.

In Sunshine, the highest reading was  $114.4^{\circ}$  on the 5th.

On Ground, the lowest reading was  $33.0^{\circ}$  on the 21st.

The Sea has fallen to  $58.0^{\circ}$ , averaging  $59.6^{\circ}$ .

Thunderstorms passed on the 25th and 26th.

Hail fell on the 7th, 8th, and 25th.

Total Rainfall since last June 10.027 inches ; the average of 13 years, 15.250 inches.

### FEBRUARY.

The Dew-Point ranged between  $35.3^{\circ}$  on the 17th and  $56.9^{\circ}$  on the 24th.

In Sunshine, the highest reading was  $119.1^{\circ}$  on the 15th.

On Ground, the lowest reading was  $33.2^{\circ}$  on the 18th.

The Sea has risen to  $59.8$ , averaging  $59.5$ .

Thunderstorms passed on the 24th.

Hail fell on the 16th and 17th.

Total Rainfall since last June, 11.934 inches ; the average of 13 years, 17.413 inches.

### MARCH.

The Dew-point ranged between  $56.3^{\circ}$  on the 24th, and  $42.0^{\circ}$  on the 30th.

In Sunshine, the highest reading was  $132.3^{\circ}$  on the 2nd.

On Ground, the lowest reading was  $40.0^{\circ}$  on the 13th.

The Sea has averaged  $59.0^{\circ}$ .

Thunderstorms passed on the 3rd.

Lightning was seen on the 30th.

Total Rainfall since last June  $12.960$  inches ; the average of 13 years,  $18.453$  inches.

### APRIL.

The Dew-point ranged between  $40.4^{\circ}$  on the 14th, and  $56.5^{\circ}$  on the 23rd.

In Sunshine, the highest reading was  $134.7^{\circ}$  on the 30th.

On Ground, the lowest reading was  $37.2^{\circ}$  on the 4th.

The Sea has averaged  $60.0^{\circ}$

Thunderstorms passed on the 8th, 10th, and 28th.

Lightning was seen on the 4th and 6th.

Hail fell on the 8th.

Total Rainfall since last June  $16.302$  inches ; the average of 13 years,  $19.188$  inches.

Mean temperature for the month, highest reading of Max. Ther., and lowest reading of Min. Ther. are the lowest yet recorded for April ; whilst total rainfall and mean amount of cloud give notably the highest readings.

### MAY.

The Dew-point ranged between  $47.3^{\circ}$  on the 2nd and  $60.8^{\circ}$  on the 29th.

In Sunshine, the highest reading was  $129.7^{\circ}$  on the 22nd

On Ground, the lowest reading was  $44.8^{\circ}$  on the 3rd.

The Sea has risen to  $67.0^{\circ}$ , averaging  $63.2^{\circ}$ .

Thunderstorms passed on the 12th.

Lightning was seen on the 23rd.

Total Rainfall since last June  $17.323$  inches ; the average of 13 years,  $19.825$  inches.

## JUNE.

The Dew-point ranged between  $50.2^{\circ}$  on the 11th and  $67.8^{\circ}$  on the 27th.

In Sunshine, the highest reading was  $146.6^{\circ}$  on the 28th.

On Ground, the lowest reading was  $50.0^{\circ}$  on the 3rd and 8th.

The Sea has risen to  $71.5^{\circ}$ , averaging  $68.3^{\circ}$ .

Lightning was seen on the 1st and 16th.

Total Rainfall since last June  $17.323$  inches ; the average of 13 years  $19.899$  inches.

## JULY.

The Dew-point ranged between  $55.8^{\circ}$  on the 4th, and  $73.9^{\circ}$  on the 16th.

In Sunshine, the highest reading was  $150.7^{\circ}$  on the 19th.

On Ground, the lowest reading was  $58.1^{\circ}$  on the 10th.

The Sea has risen to  $80.0^{\circ}$ , averaging  $77.3$ .

Thunderstorms passed, on the 13th.

Lightning was seen on the 21st.

## AUGUST.

The Dew-point ranged between  $76.0^{\circ}$  on the 6th, and  $53.3^{\circ}$  on the 29th.

In Sunshine the highest reading was  $152.0^{\circ}$  on the 11th.

On Ground the lowest reading was  $52.9$  on the 31st.

The Sea has fallen to  $76.2^{\circ}$ , averaging  $79.0^{\circ}$ .

Thunderstorms passed on the 28th.

## SEPTEMBER.

The Dew-point ranged between  $74.1^{\circ}$  on the 10th, and  $53.5^{\circ}$  on the 26th.

In Sunshine the highest reading was  $143.7^{\circ}$  on the 10th.

On Ground, the lowest reading was  $55.3^{\circ}$  on the 29th

The Sea has fallen to  $74.6^{\circ}$ , averaging  $77.0^{\circ}$ .

Thunderstorms passed on the 14th.

Lightning was seen on the 17th and 18th.

Total Rainfall since last June — inches ; the average of 13 years, 1·231 inches.

#### OCTOBER.

The Dew-Point ranged between 71·6° on the 14th and 47·3° on the 16th.

In Sunshine, the highest reading was 134·8° on the 12th.

On Ground, the lowest reading was 50·3° on the 27th.

The Sea has fallen to 72·0°, averaging 73·5.

Thunderstorms passed on the 1st, 2nd, 3rd, and 5th.

Lightning was seen on the 4th, 12th, 13th, 24th, and 25th.

Hail fell on the 3rd.

Total Rainfall since last June 2·502 inches ; the average of 18 years, 4·018 inches.

#### NOVEMBER.

The Dew-point ranged between 68·5° on the 6th, and 44·1° on the 30th.

In Sunshine, the highest reading was 124·7° on the 16th.

On Ground, the lowest reading was 44·4° on the 23rd.

The Sea has fallen to 65·5°, averaging 69·8°.

Thunderstorms passed on the 16th, 24th, 25th.

Lightning was seen on the 1st, 6th, 9th, 11th, 13th, 14th, 17th, 22nd, 23rd, 29th.

Hail fell on the 16th, 26th.

Total Rainfall since last June 7·617 inches ; the average of 13 years, 7·311 inches

#### DECEMBER.

The Dew-point ranged between 40·1° on the 1st, and 58·1° on the 20th.

In Sunshine, the highest reading was 117·2° on the 7th.

On Ground, the lowest reading was 38·0° on the 2nd.

The Sea has fallen to 59·5°, averaging 62·5.

Thunderstorms passed on the 20th.

Hail fell on the 20th.

Total Rainfall since last June, 11·604 inches ; the average of 13 years, 11·520 inches.

### NOTES FOR THE YEAR.

The Dew-point ranged between  $32.2^{\circ}$  on January 8th, and  $76.0^{\circ}$  on August 6th.

In Sunshine, the highest reading was  $152.0^{\circ}$  on August 11th.

On Ground, the lowest reading was  $33.0^{\circ}$  on January 21st.

The Sea has ranged from  $58.0^{\circ}$  on January 30th, to  $81.8^{\circ}$  on August 5th.

Thunderstorms passed on 19 days.

Lightning was seen on 23 days.

Hail fell on 10 days.

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### CORRIGENDUM.

In the Summary for 1895, the lowest mean temperature of a month was given "February 1891, and was  $49.5^{\circ}$ ," should be

" " "  $49.8^{\circ}$ .











STONYHURST

OBSERVATIONS

STONYHURST COLLEGE  
LANCASHIRE

*With FATHER SIDGREAVES.*  
*COMPLIMENTS.*

1897.

OLITHROE :  
PRINTED BY PARKINSON AND BLACOW,  
1898.



STONYHURST COLLEGE  
OBSERVATORY.

RESULTS

OF

METEOROLOGICAL & MAGNETICAL  
OBSERVATIONS

WITH REPORT AND NOTES OF THE DIRECTOR,

REV. W. SIDGREAVES, S.J., F.R.A.S.

1897.

OLITHEBOE :

PRINTED BY PARKINSON AND BLACOW, TIMES OFFICE.

1898.





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## REPORT AND NOTES.

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ALL the meteorological self-recording instruments have been working well during the year. The photographic curves of atmospheric pressure and temperature have been uniformly clean and strong, excepting those of the last ten days of April, which were weak, and those for May 4th and 12th, September 3rd and 11th, which were lost when alterations had to be made at the gas works.

The mechanical traces of wind, velocity and direction, are clear, but not very strong in calm weather.

The pluviometer lines have been very clear and strong since August, 1896, when the Brevetée plume was substituted for the pencil.

The sunshine recorder was found to be somewhat out of level, owing to subsidence of the masonry on which it was mounted, and was re-set on July 12.

The usual meteorological reports have been forwarded regularly to the Meteorological Office, and to the Registrar General; and occasional detailed reports have been sent to applications

The most noteworthy barometric depression of the year accompanied the gale of wind on November 28th, 29th, when the mercury fell from 29.356 at midnight, 27th, to 28.583 inches at half-past eleven p.m., 28th, half-an-hour before the gale reached its highest velocity of 49 miles per hour. The strongest gale of the year occurred in February, on the 21st. March was the roughest month; and December took the second place.

A tabular summary of recorded sunshine during the last 17 years is given on page 38. The table has been compiled directly from the records, without reference to previous publications. The percentage figures will be found to be lower generally than the corresponding previous quotations, up to January, 1891. Before that year a computing table was used which seems to have been formed upon an estimated total of *recordable* instead of *possible* sunshine. The figures now are formed upon the ratio of the recorded number of hours of sunshine to the aggregate number of







STONYHURST COLLEGE  
OBSERVATORY.

STONYHURST COLLEGE OBSERVATORY,  
LANCASHIRE.

*With FATHER SIDGREAVES'*  
*COMPLIMENTS.*

# FEBRUARY, 1897.

Results of Observations taken during the Month.				Mean for the last 50 years
Mean Reading of the Barometer .....	inches	29·610		29·519
Highest	„ on the 22nd „	30·166		30·074
Lowest	„ on the 2nd „	28·814		28·705
Range of Barometer Readings .....	„	1·352		1·369
Highest Reading of a Max. Therm. on the 26th		55·8		52·1
Lowest Reading of a Min. Therm. on the 6th		27·0		22·2
Range of Thermometer Readings .....		28·8		29·9
Mean of all the Highest Readings.....		46·1		44·2
Mean of all the Lowest Readings.....		35·1		33·5
Mean Daily Range .....		11·0		10·7
Deduced Monthly Mean (from Mean of Max. and Min.) .....		40·2		38·2
Mean Temperature from Dry Bulb.....		40·9		38·3
Adopted Mean Temperature .....		40·6		38·2
Mean Temperature of Evaporation.....		39·1		36·8
Mean Temperature of Dew Point .....		37·2		34·6
Mean elastic force of Vapour .....		0·222 in		0·193 in
Mean weight of Vapour in a cub. ft. of air .....		2·6 gr		2·4 gr
Mean additional weight required for saturation		0·4 gr		0·4 gr
Mean degree of Humidity (saturation 1·00)...		0·88		0·87
Mean weight of a cubic foot of air.....		548·8 gr		549·0 gr
Fall of Rain.....		4·170 in		3·491 in
Number of days on which Rain fell.....		20		16·9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	4	4	1	0	3	6	10	0
Mean Velocity in miles per hour	5·2	4·8	7·9	0	11·5	12·8	12·5	0
Total No. of miles for each direction	501	458	190	0	828	1845	3011	0

The total number of miles registered during the month was 6833.  
The max. Velocity of the wind was 56 miles per hour, W.,  
on the 21st, at 2-0 a.m.



# FEBRUARY, 1897.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	8·9
In the month of February, the highest reading of the Barometer during 50 years, was on the 11th, in 1849, and was ..	30·452
The lowest .. 6th, 1867 ..	28·208
The highest Temperature 8th, 1877 ..	58·3
The lowest .. 18th, 1895 ..	8·0
The highest adopted mean temperature of the month, 1869....	44·0
The lowest .. .. 1855....	28·6

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure .. ..	+	·091 inches
Monthly range .. ..	—	·017 ..
Mean of highest temperatures .. ..	+	1·9 degrees
Mean of lowest .. ..	+	1·6 ..
Mean daily range .. ..	+	0·3 ..
Adopted mean temperature .. ..	+	2·4 ..
Total rainfall .. ..	+	0·679 inches

Ground Frost on the 1st—4th, 6th—8th, 10th—12th, 16th—18th, 27th and 28th Snow on the 1st—4th. Hail on the 3rd. Heavy Rain on the 4th and 25th. Gale of Wind on the 21st. Fog on the 9th and 13th.

# MARCH, 1897.

Results of Observations taken during the Month.		Mean for the last 50 years.
Mean Reading of the Barometer . . . . . inches	29·145	29·460
Highest                    „                    on the 7th                    „	29·719	30·069
Lowest                    „                    on the 3rd                    „	28·157	28·655
Range of Barometer Readings . . . . . „	1·562	1·414
Highest Reading of a Max. Ther. on the 21st & 23rd	56·0	57·2
Lowest Reading of a Min. Therm. on the 29th	24·2	22·5
Range of Thermometer Readings . . . . .	31·8	34·7
Mean of all the Highest Readings . . . . .	48·9	47·3
Mean of all the Lowest Readings . . . . .	36·6	34·1
Mean Daily Range . . . . .	12·3	13·2
Deduced Monthly Mean (from Mean of Max. and Min.) . . . . .	41·8	39·8
Mean Temperature from Dry Bulb . . . . .	42·2	40·0
Adopted Mean Temperature . . . . .	42·0	39·9
Mean Temperature of Evaporation . . . . .	40·0	38·0
Mean Temperature of Dew Point . . . . .	37·5	35·5
Mean elastic force of Vapour . . . . .	0·225 in	0·206 in
Mean weight of Vapour in a cub. ft. of air . . . .	2·6 gr	2·4 gr
Mean additional weight required for saturation	0·5 gr	0·5 gr
Mean degree of Humidity (saturation 1·00) . .	0·85	0·85
Mean weight of a cubic foot of air . . . . .	538·6 gr	546·3 gr
Fall of Rain . . . . .	5·393 in	3·246 in
Number of days on which Rain fell . . . . .	27	17·8

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	1	1	3	1	9	6	10	0
Mean Velocity in miles per hour	5·0	10·1	8·4	6·2	16·5	14·5	19·2	0
Total No. of miles for each Direction	120	242	604	149	3558	2094	4611	0

The total number of miles registered during the month was 11378.  
The max. Velocity of the wind was 50 miles per hour, W.S.W.,  
on the 19th at 1·0 p.m.

## MARCH, 1897.

Mean amount of Cloud (an overcast sky being indicated by 10·0)				9·2
In the month of March, the highest reading of the Barometer during 50 years, was on the 6th in 1852, and was....				
				30·401
The lowest	„	3rd, 1897	„	28·157
The highest Temperature	„	25th, 1871	„	68·0
The lowest	„	6th, 1886	„	11·5
The highest adopted mean temperature of the month, 1871..				44·0
The lowest	„	1855 and 1892	„	35·6

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	—	0·315 inches
Monthly range	„ ..	+	0·148 „
Mean of highest temperature	..	+	1·6 degrees
Mean of lowest	„ ..	+	2·5 „
Mean daily range	„ ..	—	0·9 „
Adopted mean temperature	.. ..	+	2·1 „
Total rainfall	.. ..	+	2·147 inches

The lowest reading of the barometer during the month of March for the last 50 years occurred on the 3rd, when the mercury stood at 28·157 inches. Ground frost on the 1st, 2nd, 4th, 6th—8th, 10th, 11th, 14th, 16th and 29th—31st. Snow on the 2nd, 12th, 15th, 29th and 30th. Hail on the 1st, 3rd, 4th, 5th, 10th and 12th. Heavy rain on the 4th and 26th. Gales of wind on the 2nd, 3rd, 4th, 17th, 18th, 19th and 24th—28th. Thunder on the 16th.

## APRIL, 1897.

Results of Observations taken during the Month		Mean for the last 50 years.
Mean Reading of the Barometer..... inches	29.432	29.488
Highest               ,,               on the 22nd   ,,	29.857	29.969
Lowest               ,,               on the 1st   ,,	28.766	28.810
Range of Barometer Readings .....	1.091	1.159
Highest Reading of a Max. Therm. on the 28th	62.1	66.0
Lowest Reading of a Min. Therm. on the 4th	26.8	28.1
Range of Thermometer Readings .....	35.3	37.9
Mean of all the Highest Readings .....	52.5	55.9
Mean of all the Lowest Readings .....	35.7	37.8
Mean Daily Range.....	16.8	18.1
Deduced Monthly Mean (from Mean of Max. and Min.) .....	42.6	44.5
Mean Temperature from Dry Bulb .....	43.3	44.6
Adopted Mean Temperature.....	43.0	44.5
Mean Temperature of Evaporation .....	40.1	41.7
Mean Temperature of Dew Point .....	36.6	38.2
Mean elastic force of Vapour .....	0.217 in	0.236 in
Mean weight of Vapour in a cub. ft. of air.....	2.5 gr	2.7 gr
Mean additional weight required for saturation	0.7 gr	0.7 gr
Mean degree of Humidity (saturation 1.00)..	0.79	0.80
Mean weight of a cubic foot of air .....	542.9 gr	542.1 gr
Fall of Rain.....	3.045 in	2.299 in
Number of days on which Rain fell .....	15	14.6

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	3	5	7	1	2	3	8	1
Mean Velocity in miles per hour	7.6	9.3	10.9	13.5	17.7	10.7	13.2	6.8
Total No. of miles for each Direction	548	1118	1824	325	849	767	2528	164

The total No. of miles registered during the month was 8123.  
The max. Velocity of the wind was 35 miles per hour, S., on the 11th at 3-0 p.m.

## APRIL, 1897.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	7·5
In the month of April, the highest reading of the Barometer during 50 years, was on the 17th, in 1887, and was.....	30 251
The lowest                   ,,           20th, 1868                   ,,           .....	28·358
The highest Temperature       14th, 1852                   ,,           .....	74·1
The lowest                   ,,           13th, 1892                   ,,           .....	20·8
The highest adopted mean temperature of the month, 1865....	48·5
The lowest                   ,,                                   ,,                                   1879 ....	40·7

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure ...	...	—	0·056 inches
Monthly range                   ,,           ...	...	—	0·068   ,,
Mean of highest temperatures ..	...	—	3·4 degrees
Mean of lowest                   ,,           ...	...	—	2·1   ,,
Mean daily range                   ,,           ...	...	—	1·3   ,,
Adopted mean temperature ...	...	—	1·5   ,,
Total rainfall                   ...           ...	...	+	0·746 inches

Ground frost on the 1st—8th, 10th, 11th, 15th, 22nd, 23rd and 25th.  
 Snow on the 4th and 15th. Hail on the 1st, 14th and 15th. Heavy  
 Rain on the 13th and 17th. Thunder on the 14th. Lightning  
 on the 14th.

## MAY, 1897.

Results of observations taken during the Month.		Mean for the last 50 years.
Mean Reading of the Barometer..... inches	29·553	29·517
Highest                    "           on the 16th   ,,	30·080	29·955
Lowest                    "           on the 28th   ,,	28·873	28·955
Range of Barometer Readings.....   ,,	1·207	1·000
Highest Reading of a Max. Therm. on the 24th	70·4	72·1
Lowest Reading of a Min. Therm. on the 10th	29·8	31·3
Range of Thermometer Readings .....	40·6	40·8
Mean of all the Highest Readings.....	59·5	59·9
Mean of all the Lowest Readings .....	39·7	42·0
Mean Daily Range .....	19·8	17·9
Deduced Monthly Mean (from Mean of Max. and Min.).....	47·9	49·1
Mean Temperature from Dry Bulb, .....	48·7	49·6
Adopted Mean Temperature .....	48·3	49·4
Mean Temperature of Evaporation.....	44·2	46·1
Mean Temperature of Dew Point .....	39·7	42·5
Mean elastic force of Vapour .....	0·245 in	0·276 in
Mean weight of Vapour in a cub. ft. of air ....	2·8 gr	3·1 gr
Mean additional weight required for saturation	1·1 gr	0·9 gr
Mean degree of Humidity (saturation 1·00) ..	0·72	0·76
Mean weight of a cubic foot of air.....	539·3 gr	537·1 gr
Fall of Rain .....	3·524 in	2·572 in
Number of days on which Rain fell.....	17	15·1

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	0	8	3	0	2	3	13	2
Mean Velocity in miles per hour	0	9·4	9·0	0	13·3	14·8	11·2	11·5
Total No. of miles for each Direction	0	1812	649	0	636	1062	3491	554

The total number of miles registered during the month was 8204.  
The max. Velocity of the wind was 32 miles per hour, W.S.W.,  
on the 5th at noon.

## MAY, 1897.

Mean amount of Cloud (an overcast sky being indicated by 10·0	6·9
In the month of May, the highest reading of the Barometer during 50 years, was on the 2nd in 1895, and was.....	30·217
The lowest                   ,,           28th, 1877                   ,,           .....	28·559
The highest Temperature   19th, 1864                   ,,           .....	82·5
The lowest                   ,,           4th, 1855                   ,,           .....	23·5
The highest adopted mean temperature of the month, 1848	55·1
The lowest                   ,,                                   ,,                                   1855	45·0

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	+	0·036 inches
Monthly range	,,	..	+	0·207   ,,
Mean of highest temperatures		..	—	0·4 degrees
Mean of lowest	,,	..	—	2·3   ,,
Mean daily range	,,	..	+	1·9   ,,
Adopted Mean temperature	..	..	—	1·1   ,,
Total rainfall	..	..	+	0·950 inches

Ground Frost on the 1st, 4th, 10th—12th and 23rd.   Snow on the 10th and 12th.   Hail on the 5th, 6th, 10th and 29th.   Heavy rain on the 28th.   Thunder on the 9th, 28th and 29th.   Lightning on the 28th.

## JUNE, 1897.

Results of Observations taken during the Month.		Mean for the last 50 years.
Mean Reading of the Barometer	inches 30.204	30.111



## JUNE, 1897.

Mean amount of Cloud (an overcast sky being indicated by 10·0)	8·8
In the month of June, the highest reading of the Barometer during 50 years, was on the 15th, in 1874, and was .....	30·219
The lowest                   ,,           23rd, 1893                   ,,           .....	28·813
The highest Temperature   18th, 1893                   ,,           .....	88·7
The lowest                   ,,           17th, 1892                   ,,           .....	34·1
The highest adopted mean temperature of the month, 1858 ..	59·0
The lowest                   ,,                   ,,           1856 and 1860..	52·2

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure ...	...	+	0·060 inches
Monthly range           ,,           ...	...	+	0·090   ,,
Mean of highest temperatures ...	...	+	1·5 degrees
Mean of lowest           ,,           ...	...	+	2·3   ,,
Mean daily range       ,,           ...	...	—	0·8   ,,
Adopted mean temperature ...	...	+	1·7   ,,
Total rainfall                   ...	...	+	1·190 inches

Heavy Rain on the 1st, 17th and 19th. Gale of Wind on the 16th. Thunder on the 1st and 29th. Lightning on the 1st.

## JULY, 1897.

Results of Observations taken during the Month.		Mean for the last 50 years
Mean Reading of the Barometer .....	inches 29·597	29·504
Highest .....	on the 11th ,, 29·979	29·881
Lowest .....	on the 20th ,, 29·223	28·999
Range of Barometer Readings.....	,, 0·756	0·882
Highest Reading of a Max. Therm. on the 16th	80 0	78·8
Lowest Reading of a Min. Therm. on the 6th	43·0	42·1
Range of Thermometer Readings .....	37·0	36·7
Mean of all the Highest Readings .....	70·5	67·9
Mean of all the Lowest Readings .....	50·6	50·7
Mean Daily Range.....	19·9	17·2
Deduced Monthly Mean (from Mean of Max. and Min.) .....	58·7	57·7
Mean Temperature from Dry Bulb.....	59·2	57 8
Adopted Mean Temperature .....	59·0	57·8
Mean Temperature of Evaporation .....	55·4	54·7
Mean Temperature of Dew Point .....	52·2	52·1
Mean elastic force of Vapour .....	0·391 in	0·389 in
Mean weight of Vapour in a cubic ft. of air .....	4·4 gr	4·5 gr
Mean additional weight required for saturation	1·2 gr	1·0 gr
Mean degree of Humidity (saturation 1·00)...	0·78	0 82
Mean weight of a cubic foot of air .....	528·0 gr	527·4 gr
Fall of Rain.....	2·743 in	4·184 in
Number of days on which Rain fell.....	11	17·9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	5	3	0	1	3	17	0
Mean Velocity in miles per hour	3·6	5·2	10·0	0	7·6	9·8	12·7	0
Total No. of miles for each Direction	171	621	718	0	182	706	5182	0

The total number of miles registered during the month was 7580.  
The max. Velocity of the wind was 30 miles per hour, W.,  
on the 7th, at Noon, and at 1 p.m.

## JULY, 1897.

Mean amount of Cloud (an overcast sky being indicated by 10·0)					6·9
In the month of July, the highest reading of the Barometer during 50 years, was on the 24th, in 1868, and was .....					30·112
The lowest	„	15th, 1877	„	.....	28·564
The highest Temperature		22nd, 1878	„	.....	88·2
The lowest	„	1st, 1857	„	.....	36·0
The highest adopted mean temperature of the month, 1852 ..					63·0
The lowest	„	„	1888	....	54·5

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure	..	..	+	0·093 inches
Monthly Range	„	..	—	0·126 „
Mean of highest temperatures	..	..	+	2·6 degrees
Mean of lowest	„	..	+	0·1 „
Mean daily range	„	..	+	2·7 „
Adopted mean temperature	..	..	+	1·2 „
Total rainfall	..	..	—	1·441 inches

Hail on the 25th. Heavy Rain on the 8th and 25th. Thunder on the 25th. Lightning on the 25th.

## AUGUST, 1897.

Results of Observations taken during the Month.		Mean for the last 50 years.
Mean Reading of the Barometer . . . . . inches	29·351	29·487
Highest . . . . . on the 8rd . . . . .	29·831	29·883
Lowest . . . . . on the 21st . . . . .	28·911	28·949
Range of Barometer Readings . . . . .	0·920	0·934
Highest Reading of a Max. Therm. on the 2nd	83·8	77·1
Lowest Reading of a Min. Ther. on the 26th & 28th	45·0	41·3
Range of Thermometer Readings . . . . .	38·8	35·8
Mean of all the Highest Readings . . . . .	70·0	67·2
Mean of all the Lowest Readings . . . . .	51·9	50·4
Mean Daily Range . . . . .	18·1	16·8
Deduced Monthly Mean (from Mean of Max. and Min.) . . . . .	59·8	57·1
Mean Temperature from Dry Bulb . . . . .	60·1	57·5
Adopted Mean Temperature . . . . .	59·7	57·3
Mean Temperature of Evaporation . . . . .	56·1	54·5
Mean Temperature of Dew Point . . . . .	52·9	51·8
Mean elastic force of Vapour . . . . .	0·402 in	0·387 in
Mean weight of Vapour in a cub. ft. of air . . . . .	4·5 gr	4·3 gr
Mean additional weight required for saturation	1·3 gr	0·9 gr
Mean degree of Humidity (saturation 1·00) . .	0·79	0·82
Mean weight of a cubic foot of air . . . . .	522·7 gr	527·3 gr
Fall of Rain . . . . .	7·685 in	5·089 in
Number of days on which Rain fell . . . . .	24	19·2

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	2	2	2	4	5	6	10	0
Mean Velocity in miles per hour	2·6	4·5	6·0	8·4	9·1	11·0	8·9	0
Total No. of miles for each Direction	127	216	285	802	1097	1581	2134	0

The total number of miles registered during the month was 6242.  
The max. Velocity of the wind was 29 miles per hour, S. b E.,  
on the 20th at 11-0 a.m.

## AUGUST, 1897.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·4

In the month of August, the highest reading of the Barometer during 50 years, was on the 21st, in 1874, and was .... 30·114

The lowest ,, 31st, 1876 ,, .. 28·555

The highest Temperature 2nd, 1868 ,, .... 88·0

The lowest ,, 18th, 1887 ,, .... 83·4

The highest adopted mean temperature of the month, 1857 & '84 61·0

The lowest ,, ,, 1848 .... 52·5

## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure .. .. — 0·186 inches

Monthly range ,, .. — 0·014 ,,

Mean of highest temperatures .. .. + 2·8 degrees

Mean of the lowest ,, .. + 1·5 ,,

Mean daily range ,, .. + 1·3 ,,

Adopted mean temperature .. .. + 2·4 ,,

Total rainfall .. .. + 2·596 inches

Heavy Rain on the 6th, 10th, 17th, 20th and 21st. Thunder on the 4th, 5th, 6th, 11th, 21st, 22nd, 24th, 28th, 30th and 31st. Lightning on the 4th, 5th, 6th, 11th and 18th.

# SEPTEMBER, 1897.

Result of Observations taken during the Month.		Mean for the last 50 years
Mean Reading of the Barometer .....	inches 29·545	29·517
Highest .....	on the 13th ,, 30·144	30·028
Lowest .....	on the 2nd ,, 28·735	28·846
Range of Barometer Readings .....	,, 1·409	1·182
Highest Reading of a Max. Therm. on the 13th	70·4	72·5
Lowest Reading of a Min. Therm. on the 17th	32·0	36·4
Range of Thermometer Readings .....	38·4	36·1
Mean of all the Highest Readings .....	62·2	62·3
Mean of all the Lowest Readings .....	44·2	47·0
Mean Daily Range .....	18·0	15·3
Deduced Monthly Mean (from Mean of Max. and Min.) .....	51·9	53·5
Mean Temperature from Dry Bulb .....	53·2	54·0
Adopted Mean Temperature.....	52·6	53·7
Mean Temperature of Evaporation.....	49·3	51·0
Mean Temperature of Dew Point .....	46·0	48·3
Mean elastic force of Vapour .....	0·311 in	0·339 in
Mean weight of Vapour in a cub. ft. of air ...	3·5 gr	4·0 gr
Mean additional weight required for saturation	1·0 gr	0·8 gr
Mean degree of Humidity (saturation 1·00)...	0·79	0·82
Mean weight of a cubic foot of air .....	534·3 gr	532·3 gr
Fall of Rain .....	5·733 in	4·620 in
Number of days on which Rain fell .....	18	17·9

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	5	8	0	0	2	5	14	1
Mean Velocity in miles per hour	3·2	4·2	0	0	6·8	11·2	10·6	9·3
Total No. of miles for each Direction	379	300	0	0	325	1849	3565	221

The total number of miles registered during the month was 6139.  
The max. Velocity of the wind was 38 miles per hour on the 21st.  
Direction W.N.W. at noon.

**The lowest**                „                „                1863 ...    50·9

<b>Total rainfall</b>	...	...	...	<b>+ 1.113 inches</b>
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Ground Frost on the 10th, 18th and 19th. Hail on the 3rd. Heavy Rain on the 1st, 2nd, 3rd, 4th, 23rd and 24th. Gales of Wind on the 21st. Fog on the 14th and 26th. Lightning on the 16th.

## OCTOBER, 1897.

Results of Observations taken during the Month.				Mean for the last 50 years.
Mean Reading of the Barometer .....	inches	29·732		29·426
Highest	„ on the 21st „	30·207		30·023
Lowest	„ on the 16th „	28·865		28·645
Range of Barometer Readings .....	„	1·342		1·378
Highest Reading of a Max. Therm. on the 1st		66·9		64·3
Lowest Reading of a Min. Therm. on the 11th		31·7		28·7
Range of Thermometer Readings .....		35·2		35·6
Mean of all the Highest Readings .....		57·7		54·5
Mean of all the Lowest Readings .....		42·5		41·4
Mean Daily Range... ..		15·2		13·1
Deduced Monthly Mean (from Mean of Max. and Min.) .....		49·1		47·0
Mean Temperature from Dry Bulb .....		49·5		47·6
Adopted Mean Temperature .....		49·3		47·3
Mean Temperature of Evaporation .....		46·4		45·1
Mean Temperature of Dew Point .....		43·3		42·6
Mean elastic force of Vapour .....		0·282 in		0·274 in
Mean weight of Vapour in a cub. ft. of air .....		3·2 gr		3·1 gr
Mean additional weight required for saturation		0·8 gr		0·6 gr
Mean degree of Humidity (saturation 1·00)...		0·80		0·84
Mean weight of a cubic foot of air .....		541·1 gr		537·7 gr
Fall of Rain .....		2·698 in		5·015 in
Number of days on which Rain fell .....		12		21·4

No. of days in the month on which the prevailing wind was	N	NE	E	SE	S	SW	W	NW
	7	3	4	0	4	6	5	2
Mean Velocity in miles per hour	5·8	4·7	9·0	0	13·8	7·9	7·6	3·6
Total No. of miles for each Direction.	978	341	861	0	1826	1132	910	171

The total number of miles registered during the month was 5719.  
The max. Velocity of the wind was 44 miles per hour, S., on the 17th at noon.



## OCTOBER, 1897.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 6·8

In the month of October, the highest reading of the Barometer during 50 years, was on the 5th, in 1884, and was .... 30·806

The lowest ,, 19th, 1862 ,, .... 28·189

The highest Temperature 9th, 1869 ,, .... 72·8

The lowest ,, 28th, 1895 ,, .... 17·8

The highest adopted mean temperature of the month, 1861 & '76 51·6

The lowest ,, ,, 1895 .... 42·8

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure ..	..	+	0·806 inches
Monthly range ,, ..	.. ..	—	0·036 ,,
Mean of highest temperatures ..	..	+	8·2 degrees
Mean of lowest ,, ..	..	+	1·1 ,,
Mean daily range ,, ..	..	+	2·1 ,,
Adopted mean temperature ..	..	+	2·0 ,,
Total rainfall .. ..	..	—	2·317 inches

Ground Frost from the 12th—14th. Heavy Rain on the 14th and 15th. Gales of Wind on the 10th and 17th. Thunder on the 15th and 17th. Lightning on the 15th.

NOVEMBER, 1897.
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Mean for the
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<p>The total number of miles registered during the month was 6298. The max. Velocity of the wind was 48 miles per hour, N.W. by W., on the 29th at 1 and 3 a.m.</p>
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NOVEMBER, 1897.

**Mean amount of Cloud (an overcast sky being indicated by 10·0) 8·2**

**In the month of November, the highest reading of the Barometer during 50 years was on the 12th, in 1857, and was 30·350**

**The lowest                      „                      11th, 1891                      „                      27·938**

**The highest Temperature**                      **2nd, 1894**                      **„**                      **62·0**

**The lowest**                „                **17th, 1861**                „                **19·1**

**The highest adopted mean temperature of the month, 1881 47.0**

<b>The lowest</b>	„	„	<b>1851</b>	<b>36·7</b>
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## TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

**Mean barometric pressure** ... .. + 0.392 inches

**Monthly range**        „        ...        ...        +    0·181        „

**Mean of highest temperatures** ... + 4·0 degrees

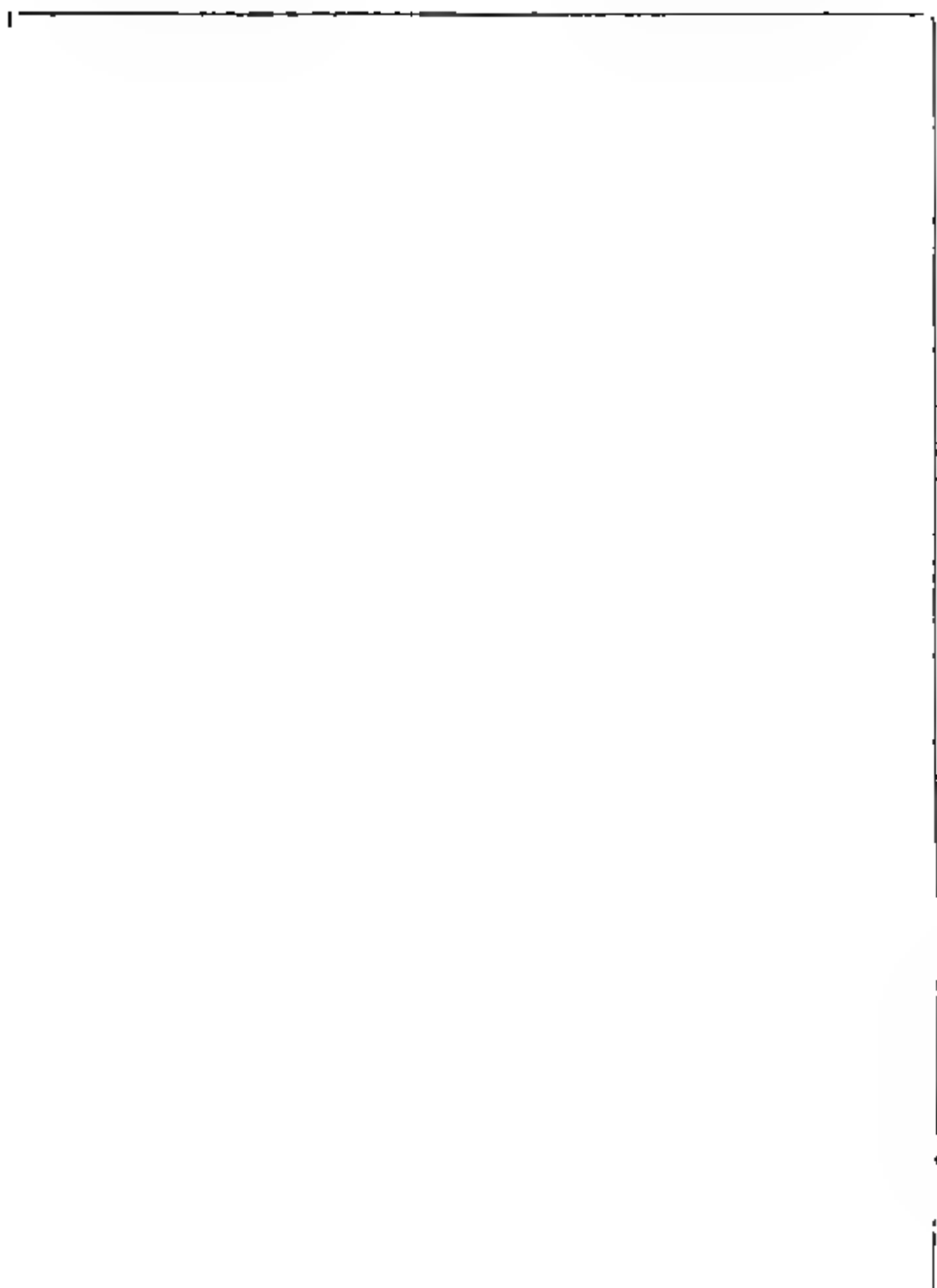
**Mean of lowest**        „        ...        ...        +        4·5        „

**Mean daily range**    „    ...    ...    —    0·5    „

**Adopted mean temperature ... .. + 4.1 ..**

**Total rainfall**                    ...                    ...                    ...                    +   **1.588 inches**

Ground Frost on the 15th, 16th, 23rd, 24th, and 28th—31st.  
Hoar Frost on the 24th Hail on the 28th. Heavy Rain on the  
17th, 26th, 28th, and 30th. Gales of Wind on the 28th and 29th.  
Fog on the 22nd and 23rd. Thunder on the 28th. Lightning on the  
28th.



## DECEMBER, 1897.

Mean amount of Cloud (an overcast sky being indicated by 10·0) 7·4

In the Month of December, the highest reading of the Barometer during 50 years, was on the 22nd, in 1849, and was 30·378

The lowest                   ,,                   8th, 1886                   ,,       .... 27·350

The highest Temperature                   9th, 1876                   ,,       .... 58·1

The lowest                   ,,                   24th, 1860                   ,,       .... 6·7

The highest adopted mean temperature of the month 1857.. 44·6

The lowest                   ,,                   1878                   ,,       .... 30·3

### TABLE OF DIFFERENCES.

The signs + and — mean respectively above and below the monthly average.

Mean barometric pressure .. .. — 0·045 inches

Monthly range                   ,,       ..       .. + 0·309       ,,

Mean of highest temperatures                   ..       .. + 3·1 degrees

Mean of lowest                   ,,       ..       .. + 1·4       ,,

Mean daily range                   ,,       ..       .. + 1·7       ,,

Adopted mean temperatures .. .. + 2·6       ,,

Total rainfall                   ..       ..       .. — 0·565 inches

Ground Frost from the 1st—4th, 12th—15th, 21st—26th, and on the 29th. Snow on the 1st, 2nd, and 8th. Hail on the 6th, 8th, 11th, 14th and 15th. Heavy Rain on the 5th and 7th. Gales of wind on the 8th, 9th, 27th, 29th, 30th and 31st. Fog on the 3rd. Lightning on the 30th.

## Summary of Observations FOR 1897.

Results of Observations taken during the Year.			Mean for the last 50 years.
Mean Reading of the Barometer.....inches	29·517		29·491
Highest               ,,       on November 20th ,,	30·272		30·283
Lowest               ,,       on March 3rd ,,	28·157		28·262
Range of Barometer Readings .....	2·115		2·021
Highest Reading of Max. Ther. on Aug. 2nd	83·8		81·7
Lowest Reading of a Min. Therm. on Dec. 22nd	20·3		15·4
Range of Thermometer Readings .....	63·5		66·3
Mean of all the Highest Readings .....	56·0		54·8
Mean of all the Lowest Readings .....	40·9		40·6
Mean Daily Range.....	15·1		14·2
Deduced yearly Mean (from Mean of Max. and Min.) .....	47·4		46·8
Mean Temperature from dry bulb .....	47·9		46·7
Adopted Mean Temperature .....	47·7		46·8
Mean Temperature of Evaporation .....	45·0		44·5
Mean Temperature of Dew Point .....	42·2		42·1
Mean elastic force of Vapour .....	0·278 in		0·273 in
Mean weight of Vapour in a cub. ft. of air ....	3·2 gr		3·3 gr
Mean additional weight required for saturation	0·8 gr		0·7 gr
Mean degree of Humidity (saturation 1 00) ..	0·82		0·84
Mean weight of a cubic foot of air.....	539·3 gr		539·2 gr
Total fall of rain in the year.....	51·622 in		47·261 in
Number of days per month on which rain fell	17·5		18·0

The Maximum monthly mean height of the Barometer was  
in February, 1891, and was ..... .. inches 29·997

The Minimum       ,,       ,, in December, 1868, and was 28·984

The Maximum yearly mean height of the Barometer was in  
1896, and was..... 29·584

The Minimum       ,,       ,, in 1866, and was..... 29·389

## SUMMARY, 1897.

The greatest monthly range of the Barometer was in January, 1884, and was .....	inches	2·409
The least       ,,       ,,       in July, 1852, and was .....	,,	0·505
The highest reading of the Barometer during 50 years was on January 9th, 1896, and was .....	inches	30·597
The lowest       ,,       ,,       on December 8th, 1886, and was		27·350
Extreme range .....	inches	3·247
The highest temperature was on June 18th, 1893, and was..		88·7
The lowest       ,,       ,,       January 15th, 1881.....		4·6
The highest adopted mean temperature of a month, July, 1868, and was .....		62·4
The lowest       ,,       ,,       ,,       February, 1855, ..		28·6
The highest adopted mean temperatures of a year, 1868..		49·1
The lowest       ,,       ,,       ,,       ,,       1879..		44·1
The greatest monthly mean weight of vapour } in a cubic foot of air .....	} July, 1852..	5·1 gr
The least       ,,       ,,       February, 1855 and 1895		1·4 gr
The greatest fall of rain in a month, was in October, 1870, and was .....		13 437 in
The least       ,,       ,,       ,,       March, 1852		0 047
The greatest number of days on which } rain fell in one month .....	} July, 1861, Dec. 1868	31
The least       ,,       ,,       ,,       March 1852		3

## SUMMARY OF WIND.

No of days in the year on which the prevailing wind was .....	N	NE	E	SE	S	SW	W	NW
	42	47	39	9	47	56	114	11
Mean Velocity in miles per hour .....	5·5	6·7	9·5	8·0	13·5	10·5	12·3	9·3
Total No. of miles for each Direction .....	5582	7538	8868	1721	15206	14062	33688	2444

The total No. of miles registered during the year was 89104.

The max. Velocity of the wind was 56 miles per hour, W., on  
February 21st, at 2 a.m.

# DATES OF OCCASIONAL PHENOMENA.

1897.	Frost.	Hard Frost.	Snow	Hail.	Heavy Rain.	
January	1-8, 5, 9, 10, 18-31		8, 9, 14, 20, 22-25, 28, 29	15, 25, 31		
February	1-4, 6-8, 10-12, 16-18, 27, 28		1 4	8	4, 25	
March	1, 2, 4, 6-8, 10, 11, 14, 16, 29-31		2, 12, 15, 29, 30	1, 3, 4, 5, 10, 12	4, 26	
April	1-8, 10, 11, 15, 22, 23, 25		4, 15	1, 14, 15	18, 17	
May	1, 4, 10-12, 23		10, 12	5, 6, 10, 29	28	
June					1, 17, 19	
July					8, 25	
August	10, 18, 19			25	6, 10, 17, 20, 31	
September	12-14			8	1, 2, 3, 4, 23, 24	
October	15, 16, 23, 24, 28-31				14, 15	
November	1-4, 12-15, 21-26, 29	24		28	17, 26, 28, 30	
December			1, 2, 8	6, 8, 11 14, 15	5, 7	
1897.	Gales of Wind.	Fog.	Thunder.	Lightning.	Lunar Halo	Solar Halo.
January						
February	21	9, 13	16			
March	2, 3, 4, 17, 18, 19, 24-28		14	14		
April			9, 26, 29	28		
May	16		1, 29	1		
June			25	25		
July			4-6, 11, 21, 22, 24, 28, 30, 31	4, 5, 6, 11		
August	21	14, 26		16		
September	10, 17		15, 17	15		
October	28, 29	22, 23	28	28		
November	8, 9, 14, 27, 29, 30, 31	3		30		
December						

Aurora Borealis on January 2nd, at 10-15 p.m.



# MONTHLY TABLES FOR EACH HOUR OF RECORDED SUNSHINE

Local apparent time.	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9
January	0	0	0	0	2.0	4.5	7.7	8.7	8.9	9.4	8.9	1.4	0	0	0	0	0
February	0	0	0	0.5	2.1	5.3	5.9	5.7	5.8	8.8	1.8	1.0	0	0	0	0	0
March	0	0	0.7	2.5	4.6	8.5	9.9	8.7	11.0	10.6	11.9	10.0	4.7	0.3	0	0	0
April	0	1.2	7.0	9.8	13.5	14.4	13.8	13.9	13.2	12.9	12.9	12.5	13.2	10.1	5.3	0	0
May	2.3	10.7	16.3	19.6	17.7	19.3	21.3	20.6	20.4	20.4	20.9	20.3	21.1	15.5	12.5	4.4	0
June	1.1	4.3	6.7	9.4	10.1	10.7	12.6	12.5	13.5	11.3	13.4	12.5	11.0	12.0	6.8	0.9	0
July	2.7	8.5	12.7	12.9	12.9	14.1	15.4	17.1	19.0	18.6	17.8	18.6	16.1	16.2	12.1	4.4	0
August	0	2.3	7.1	10.8	13.3	15.8	16.6	17.1	16.9	15.3	16.0	12.6	10.4	7.5	3.1	0.2	0
September	0	0	2.8	8.0	13.0	14.9	16.4	15.4	16.2	13.3	11.0	11.4	7.9	2.7	0	0	0
October	0	0	0.2	2.4	6.3	11.6	14.3	16.2	15.3	12.2	12.4	9.4	2.8	0.6	0	0	0
November	0	0	0	0	1.8	3.8	5.6	6.0	6.6	6.5	4.8	2.4	0	0	0	0	0
December	0	0	0	0	0.5	1.6	3.1	4.8	6.6	5.5	2.2	0	0	0	0	0	0
Total	6.1	27.0	53.5	75.4	97.8	124.5	142.6	146.7	153.4	139.8	129.0	112.1	87.2	64.9	39.8	9.9	0

TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.																	
MONTH.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
January -	4.6	1.4	0.8	0	0	0	0	0	0	0	0	0	0.1	0.3	2.4	0	5.9
February -	0	0	0	0	0	0.6	3.8	0	0	0	3.4	0	0	0.6	0	4.5	3.5
March -	7.0	2.0	4.5	2.5	1.7	3.5	1.0	5.1	0	5.8	2.5	0	0.4	0	0	3.2	1.4
April -	5.4	8.2	6.4	9.3	6.4	0	1.2	10.3	0	11.1	3.7	0	0.3	0	9.2	4.2	0
May -	11.7	0	10.8	7.9	8.6	9.2	2.6	0	10.3	5.5	7.8	5.1	11.4	1.4	2.3	13.9	14.0
June -	0	4.4	0	9.5	9.8	4.0	0.2	0	4.3	6.3	7.0	12.3	8.0	7.2	8.7	1.8	4.1
July -	3.0	8.0	2.7	4.2	0.5	10.5	6.3	4.1	2.4	13.2	11.9	15.0	14.9	15.2	15.1	13.3	0
August -	11.7	12.7	11.8	11.4	5.5	4.6	2.2	0.6	11.7	4.4	2.2	4.2	0	7.0	1.4	8.4	1.6
September -	0.3	0	8.7	5.8	0	7.6	1.0	8.2	9.4	6.5	5.6	8.7	0	0	1.2	5.4	3.9
October -	8.6	0	7.5	2.6	3.8	0	2.4	0	0.5	0	3.4	6.1	6.8	0	0	5.8	0.4
November -	4.8	3.4	6.7	0	0	0	0	0	0	1.1	0	0	0	0	7.0	0	0
December -	1.5	6.0	0.4	0	0	0.5	0	1.2	0.4	0	0	0	0	1.4	1.9	1.4	0

# TOTAL AMOUNT OF SUNSHINE RECORDED ON EACH DAY.

(Continued.)

MONTH.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Monthly Total.	Per centage each month.
January -	1.2	1.4	1.9	0.2	2.1	5.6	0	3.9	5.6	4.4	1.9	2.8	0	0	46.5	18.7
February -	0.8	0	4.2	0.5	0	0.3	1.0	0	0.4	8.0	0.3	0	0	0	31.9	11.7
March -	3.6	5.8	1.0	2.6	0	1.8	0.1	3.8	1.8	3.3	0.7	8.2	9.7	0.4	83.4	22.8
April -	9.0	0	10.4	0	13.3	5.8	11.5	3.7	8.8	2.8	1.8	5.0	5.4	0	153.2	36.5
May -	12.6	14.6	11.4	14.0	14.4	15.2	14.4	0	11.3	3.7	1.7	8.2	7.5	11.4	263.3	53.8
June -	0	9.0	2.8	1.7	9.4	13.3	2.4	0	7.2	5.2	2.2	0	8.0	0	148.8	29.3
July -	8.7	14.0	0	0.5	3.0	7.8	1.8	6.2	5.3	7.3	2.7	3.8	8.2	9.5	219.1	43.0
August -	6.4	10.3	1.7	6.1	2.5	0.4	2.7	1.2	5.3	7.6	2.0	0.8	8.8	7.8	165.0	36.1
September -	9.2	9.4	7.3	7.6	0	0	0	9.8	5.8	6.3	0	0	5.3	0	133.0	35.1
October -	6.0	4.0	6.8	5.4	6.8	0.6	2.2	5.1	2.6	1.9	4.4	5.1	1.0	3.9	103.7	31.9
November -	5.4	0	2.3	0	0.7	0	0	0	0	0	0	6.2	0	0	37.5	14.7
December -	0	4.0	2.0	0	0	0	0.4	1.3	0	0	1.2	0	0.7	0	24.3	10.5

## SUMMARY OF SUNSHINE.

1897.	Number of days on which Sunshine was recorded.	Amount or Total Number of Hours	Per centage of possible Sunshine.	Mean for the last 17 Years.		
				Days.	Amount hours	Per centage of possible Sunshine
January ...	18	46 5	18·7	14·1	36·4	14·7
February...	14	31·9	11·7	17 4	57·1	20·8
March ...	26	83·4	22·8	23 5	104·3	28 5
April ...	23	153·2	36 5	25·8	146·8	35·0
May ...	28	263·3	53·3	28·0	197·8	40 2
June ...	24	148 8	29·3	27·4	190 6	37·5
July ...	29	219·1	43·0	28·4	173·1	34·0
August ...	30	165·0	36·1	27·6	142·1	31·1
September	21	133·0	35·1	25·2	122·9	32·4
October ...	25	103·7	31·9	23·1	86·8	26·6
November	9	37 5	14·7	16·4	43·5	17·0
December	15	24·3	10·5	12·9	26·5	11 5
Year	262	1409·7	31·6	269·8	1327·9	29·7

## SUMMARY OF SUNSHINE

(Continued)

## EXTREMES FOR THE LAST 17 YEARS.

MONTH	Number of Days on which Sunshine was recorded.				Amount or Total number of Hours.				Percentage of possible Sunshine.			
	GREATEST		LEAST		GREATEST		LEAST		GREATEST		LEAST	
	Days	Year	Days	Year	Hours	Year	Hours	Year	o/o	Year	o/o	Year
Jan.	21	1881	9	{ 1885 1889	64·2	1881	14 9	1885	24·8	1881	5·8	1885
Feb.	24	1895	11	1882	89·3	1887	29·6	1882	32·1	1887	10·6	1882
Mar	28	1894	19	{ 1881 1882	162·1	1893	67·0	1895	44 2	1893	18·3	1895
Apr.	28	{ 1884 1887 1892 1893 1896	23	{ 1883 1885 1888 1897	223·7	1893	95·7	1889	53·9	1893	23·1	1889
May	30	{ 1881 1884 1888	22	1886	266·6	1881	127·0	1886	55·3	1881	26·3	1886
June	30	1896	24	{ 1888 1897	272 5	1887	115·0	1890	55·2	1887	23·3	1890
July	31	1882	25	1888	247·2	1887	98·0	1888	49·8	1887	19·7	1888
Aug	31	{ 1886 1893	23	1894	194·8	1893	88·4	1891	43·5	1893	19·5	1891
Sept	29	1895	21	1897	170·0	1895	62·9	1896	45·1	1895	16·7	1896
Oct.	28	1891	17	1889	119·2	1881	50·0	1889	36·1	1881	15·2	1889
Nov	23	1883	9	1897	60 5	1884	18·5	1891	23·0	1884	7·0	1891
Dec.	18	1886	6	1882	60·1	1886	14·5	1882	24·8	1886	6 0	1882
Year	290	1887	252	1885	1613·7	1887	1132·1	1888	36·3	1887	25·4	1888

## OBSERVATIONS OF UPPER CLOUDS (CIRRUS)

Date. 1897.	G M.T.	Cloud.		Wind.		Direction of Lower Clouds.
		Direction.	Velocity (0—6.)	Direction.	Force. (0—12.)	
January 4	4 40pm	S b W	3	S b E	3	SW
" 15	8 40am	NNW	2	NNE	1	NE
" 16	9-0am	SE b S	3	ENE	0	NW
" 21	Noon	NNW	2	NW	3	N
" 27	Noon	NW b N	2	NNW	2	NW
" 29	8-45am	NW b N	3	W b S	0	
February 1	8-45am	N	2	N b E	1	NE b N
" 11	7-30am	W	3	N b W	1	
" 16	Noon	NW	2	WSW	3	SW
" 17	Noon	SW	2	SW	1	
" 21	9-15am	NW	3	W	4	W b S
" 23	1-40pm	NW	2	WSW	4	SW
" 27	7-30am	S b W	2	W b N	1	
March 3	Noon	NW	3	WNW	7	W b N
" 5	5-10pm	N	2	SW b W	2	
" 16	5-15pm	NNE	3	SW b S	5	SSW
" 19	5-10pm	W b N	3	W b S	6	W
" 23	2-20pm	W	3	WSW	3	SW
" 25	3 20pm	NW	2	W b S	5	W
" 29	4-0pm	SW	3	NW	2	NW
" 30	Noon	WSW	2	W b S	2	
April 1	7-30am	SW	3	NE b N	1	
" 3	9-0am	W b N	2	E	3	E
" 4	10-0am	SW	2	ENE	1	E
" 15	3-0pm	NW	3	WSW	5	SW
" 20	11-30am	NW	3	W b S	3	NW
" 24	9-15am	NW	3	NWE	2	NE
" 26	4-0pm	NW	3	ENE	3	
May 6	9-40am	NW	2	WNW	4	W b N
" 7	9-30am	SW	2	W b S	1	W
" 10	9-10am	SW	2	W b N	2	W
" 11	11-50am	NW b N	2	NW b W	3	NW
" 16	11-30am	W	2	NE	2	NE
" 19	8-30am	W	2	ENE	2	NE
" 26	4-0pm	W b S	2	WSW	3	SW
" 27	1-45pm	E	3	E b S	2	SW
June 4	8-20am	S	3	NE b N	1	
" 5	9-10am	S b E	3	N b E	0	N
" 9	4 0pm	W b N	2	E b N	2	E
" 10	9-0am	SW	2	ESE	1	E

## OBSERVATIONS OF UPPER CLOUDS (Continued).

Date. 1897.		G. M. T.	Cloud.		Wind.		Direction of Lower Clouds.
			Direction.	V'locity (0—6).	Direction	(Force. 0—12.)	
June	12	10-30am	S b W	2	SW	1	
"	12	Noon	SW	2	SSW	2	S
"	15	Noon	NE	3	W	2	W b S
"	19	9-0am	NW b W	2	NW b W	3	NW
"	22	4-0pm	W b S	2	WSW	2	SW
"	26	10-50am	SSE	2	NNE	1	
July	2	Noon	SW	2	SW	2	
"	4	6-0pm	NW	2	W b S	2	SW
"	12	4-0pm	NE	2	E b S	2	
"	15	10 0am	SE b E	2	NW b N	1	
"	16	5-0pm	NW b W	2	SW	1	W
"	19	7-30am	ENE	2	NNE	1	
"	22	7-30am	NW	2	WSW	1	
"	26	2-0pm	NE	3	WSW	4	SW
"	27	2-30pm	NW	2	W	3	W
"	31	11 15am	SW	2	NE b N	1	
August	1	9-0am	N	2	NE b N	1	
"	2	9-0am	N b E	2	NNE	1	
"	3	4-0pm	W	3	ESE	1	
"	10	8 0am	NW	2	E b N	1	
"	14	1-0pm	N b E	2	SW	2	SW b W
"	16	3-0pm	NW	2	SW b W	3	SW
"	18	7-20pm	NW b W	2	WNW	1	W
"	19	9-30am	NW b W	2	W b S	1	W
"	21	11-0am	NE	2	SW b W	4	SW
"	24	3-0pm	S b E	3	E	3	E b N
"	28	8-0am	S	2	S b W	2	S
"	30	Noon	NNW	3	S b E	4	SW
"	31	4-0pm	NE b E	2	SW	3	SW
Sept.	4	11-30am	N b W	3	WNW	3	W
"	8	7 30am	W	3	NNW	0	
"	16	4-40pm	N	3	WSW	2	W
"	17	8-0am	NE b E	2	W	3	W
"	19	9-0am	SE b S	2	WSW	0	NE
"	20	10-0am	NW b W	2	W b S	1	N
Oct.	1	Noon	NNW	3	ESE	0	N
"	5	7-0am	SSE	2	E b S	0	SE
"	12	Noon	NW	2	WNW	3	NW
"	13	9-0am	W	3	NW b W	1	
"	19	4-0pm	NNW	3	WNW	2	SW
"	20	8-0am	NW b N	3	SW b W	0	SW

## OBSERVATIONS OF UPPER CLOUDS (Continued).

Date. 1897.	G. M. T.	Cloud.		Wind.		Direction of Lower Clouds
		Direction	V'locity (0—6).	Direction.	Force. (0—12)	
Oct. 27	10-0am	N	2	NNE	1	N b W
" 28	9-0am	NW	3	NNE	1	
" 29	10-0am	N	2	NNE	1	
" 30	10-0am	N	2	N b E	0	
" 31	9 0am	N	2	N b E	1	NE b N
Nov. 10	11-0am	N b E	2	NE b N	1	NE
" 15	9-0am	N	2	NW	1	
" 18	4-0pm	N	2	W b S	2	
" 20	1-30pm	NNW	2	W b S	2	W
Dec. 1	1-20pm	N	2	NNW	0	NE
" 3	8-15am	N b E	3	NNE	0	
" 9	12-10pm	E	2	W b S	7	WSW
" 16	11-45am	NE b N	2	S b E	6	S
" 23	2-15pm	N	2	NNE	0	NE
" 24	10-10am	NW	2	NE b N	0	NE
" 25	9-45am	SE	1	SSW	1	
" 26	9-10am	N	2	SW b S	1	S
" 28	9-10am	N	2	S	3	S
" 30	9-0am	NW N	2	SSW	7	S



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1897.	January	February	March	April	May	June	July	August	September	October	November	December
1	.41		.50	.89	.40		.48	.87		88	.51	.54
2			.45	.82	84		.44	.83	.46	.52	.62	.44
3			.42	.40	43	.81		.37	.39	.41	.89	.44
4				.35	.79	.39		.31		.45		
5			.44	.48	.52	.41	.40	40	.39			
6		.42					51	.40	67	.52		.48
7			.38						.37			
8				.41	50	.71		.37	.37 & .67			
9			.43	.49	.84		.30	.34	.39		.52	
10		39		47	.84	.66	.42		38	65		
11					.67	.41	.65		.40	.87		
12					.52		.35			40		
13	.65					.42	.80	.54				.54 & .58
14	.39			.45		52	.55		.67		.43	.60
15	.47		46	.72	.40		.42		.41			
16		.35				.51			.41		.45	
17	.39	.42			.84		.42		.38	.39		
18		.41			.39	.80	.33	.44	.51			.40
19					34				.39	.42	.46	
20	.50	.45		.45	40				.39	.41	.49	
21					.84		.66		.38			.42
22	.45			.76	.86	.83	.36					.58
23	.47		.44	.35	.41	.66	.67	.41	.39	.52		.46
24				42	.86		.51	.84	.42	.51		
25				.52	.69	.42			.39	.42		
26	.40					.37			.42	.44	.44	.40
27	.52	.40	.65	.73					.38	.53		
28	.44		.84									
29	.40		.84		.45		.54					
30					.41		.49			.45 & .60		
31									.38		.44	.51

## OBSERVATIONS OF EARTH-MAGNETISM.

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ABSOLUTE measures of Horizontal Magnetic Force have been made once each month, by the method of Vibration and Deflection.

In these observations the same Magnet has been employed from the beginning of the series in March. 1863. The weight of the Magnet with its stirrup is 825 grains, and its length 3·94 inches nearly. Its moment of inertia, measured by the method of vibrations, with and without a known increase of the moment, is 5·27303 to the English foot—second—grain units, at the temperature 35° Fahr., and its rate of increase is 0·00073 for increase of 10°

The temperature corrections have been obtained from the formula  $q(t^\circ - 32^\circ) + q'(t^\circ - 32^\circ)^2$ , where  $t^\circ$  is the observed temperature and 32° Fahr. the adopted standard temperature. The values of the co-efficient  $q$  and  $q'$  are respectively 0·0001128 and 0·000000436.

The induction co-efficient  $\mu$  is 0·000244.

The correction for error of graduation of the Deflection bar at 1·0 foot is + 0·00004ft. at 1·3 + 0·000064 ft.

The observed times of vibration are entered in the Table without corrections.

The time of one vibration has been obtained each month from the mean of twelve determinations of the time of 100 vibrations.

The angles of deflection are each the mean of two sets of readings.

In deducing from these observations the ratio and product of the magnetic moment  $m$  of the magnet, and the earth's horizontal magnetic intensity  $X$ , the induction and temperature corrections have always been applied, and the observed time of vibration has been corrected for the effect of torsion of the suspending thread; but no correction has been required for the rate of the chronometer, or for the arc of vibration, the former having been always under 1·5s and the latter never over 50'.

The average deflection of the magnet caused by a twist of the torsion circle through 90° has been about 11'·2 of arc.

In the calculations of the ratio  $\frac{m}{X}$ , the third and subsequent

terms of the series  $1 + \frac{P}{r^2} + \frac{Q}{r^4} + \dots$ , have always been omitted.

The value of the constant P was found to be—0·00096.

The Vertical and Total Forces are deduced from the measures of the Horizontal Force, and the Angle of Inclination or Dip.

All the computations are in English foot—second—grain units ; and in the final table the results are given also in C. G. S. units, in parallel columns.

The Dip, or angle between the direction of total force, and that of its horizontal component, has been measured with Barrow's Circle, once each month by two needles, always when possible on the days of vibration and deflection observations.

The Declination has been observed at the beginning of each week, usually on Mondays at 4 p.m. and is quoted as the angle between the horizontal direction of force and the Astronomical Meridian, measured from the North Point.

The Differential Instruments, or Photo-Magnetographs, are of the same pattern as those at the Kew Observatory, except that the radial distances between the centres of the magnets and the surfaces of the respective cylinders are shorter, and the clock is not provided with an automatic light-cut-off, for the timescale. The "cut-offs" are made by hand at the hours 0, 2, 20, and 22 of the astronomical day, to furnish two time marks at each end of the day's curves, the changes being made between 10-30 and 11 a.m., civil time.

The scale value of the Bifilar horizontal force torsion balance, has remained very constant at 0·00051 C. G. S. for one centemetre, during the last five years

The scale value of the Unifilar Declination Magnet is 11'·28 arc per centimetre.

The corrections for diurnal range, employed in the tables, are taken from the Kew Reports 1891-96.

## OBSERVATIONS OF DECLINATION AND DIP.

1897	G.M.T.	WEST DECLINATION		MAGNETIC DIP.		
MONTH	CIVIL DAY	Observations.	Monthly Mean.	Needle	DIP.	G.M.T. CIVIL DAY
	D. H. M.	° ' "	° ' "		° ' "	D. H. M.
Jan.	4 16 5	18 29.2	18 30.6	1 3	68 49.5 68 56.9	16 9 24
	11 16 5	18 29.7				„ 10 9
	18 16 0	18 28.7				
	25 16 0	18 34.6				
Feb.	1 16 40	18 28.2	18 29.7	1 3	68 51.1 68 59.8	16 11 43
	8 16 0	18 28.1				„ 12 18
	15 16 0	18 28.2				
	22 16 0	18 34.2				
March	1 16 0	18 30.7	18 28.9	1 3	68 54.6 68 59.1	20 11 7
	8 16 0	18 31.7				„ 11 54
	15 16 20	18 21.5				
	22 16 0	18 26.3				
April	29 16 0	18 34.2	18 29.0	1 3	68 54.0 68 55.8	21 9 8
	5 16 0	18 31.0				„ 9 43
	12 16 5	18 30.1				
	26 16 0	18 25.9				
May	3 16 0	18 30.4	18 27.4	1 3	68 56.8 68 57.8	15 10 36
	10 16 0	18 25.9				„ 11 18
	25 16 5	18 29.6				
	31 16 0	18 23.7				
June	7 16 20	18 26.7	18 28.6	1 3	68 39.7 68 55.2	19 10 26
	14 16 15	18 29.6				„ 10 54
	21 16 10	18 27.6				
	28 16 0	18 30.5				
July	5 16 0	18 25.6	18 28.5	1 3	68 52.2 68 56.3	17 10 8
	19 16 0	18 33.9				„ 10 41
	26 16 0	18 26.1				

## OBSERVATIONS OF DECLINATION AND DIP.

*(Continued.)*

1897 MONTH	G.M.T. CIVIL DAY	WEST DECLINATION		MAGNETIC DIP.		
		Observations.	Monthly Mean.	Needle	Dip.	G.M.T. CIVIL DAY
	D. H. M.	° ' "	° ' "		° ' "	D. H. M.
Aug.	2 16 20	18 28.4	18 27.7	1 3	68 49.2 68 55.7	16 11 3 ,, 12 20
	9 16 0	18 29.2				
	16 16 5	18 28.4				
	23 16 0	18 23.9				
	30 16 25	18 28.5				
Sept.	13 16 5	18 26.7	18 25.7	1 3	68 58.0 69 0.2	20 11 39 ,, 12 13
	20 16 0	18 24.5				
	27 16 0	18 26.0				
Oct.	4 16 0	18 29.2	18 25.4	1 3	68 42.5 68 53.5	20 11 18 ,, 11 53
	11 16 5	18 27.8				
	18 15 50	18 22.6				
	25 16 0	18 22.4				
Nov.	3 16 0	18 23.7	18 23.7	1 3	68 46.6 68 58.0	19 11 9 ,, 11 52
	8 16 0	18 25.2				
	15 16 0	18 22.2				
	22 16 0	18 20.7				
	29 16 0	18 26.7				
Dec.	6 16 0	18 24.6	18 26.1	1 3	68 51.6 68 58.9	18 9 25 ,, 10 3
	13 16 15	18 26.8				
	27 16 0	18 26.9				
Yearly Mean			18 27.6		68 53.9	

**OBSERVATIONS OF VIBRATIONS AND DEFLECTIONS**  
**FOR ABSOLUTE MEASURE OF MAGNETIC FORCE.**

1897 Month.	G. M. T. (Civil Day).	Temp.	Time of one vibration	G. M. T.	Temp.	Observed Deflection at 1.0 ft. at 1.3 ft.	Value of m
	D. H. M.	°		D. H. M.	°	° '	
Jan.	15 9 51	35.0	5.9834	15 { 10 35 10 50	38.0 38.0	11 57.4 5 24.3	0.38750
Feb.	16 9 39	49.3	5.9810	16 { 10 48 10 51	50.5 50.9	11 55.8 5 24.7	0.38793
Mar.	20 9 31	46.6	5.9868	20 { 10 20 10 20	49.5 49.9	11 54.8 5 24.2	0.38714
Apr.	17 8 38	46.7	5.9888	17 { 9 32 9 48	48.0 48.0	11 57.4 5 23.2	0.38765
May	15 8 10	50.0	5.9907	15 { 9 59 9 59	52.9 52.9	11 55.6 5 23.8	0.38728
June	19 8 34	52.0	5.9878	19 { 9 49 9 50	52.5 52.9	11 55.0 5 24.0	0.38735
July	17 8 18	59.3	5.9867	17 { 9 36 9 36	62.0 62.0	11 53.9 5 23.1	0.38769
Aug.	16 10 50	62.0	5.9931	16 { 11 36 11 35	61.9 62.1	11 53.5 5 23.7	0.38735
Sept.	20 10 23	56.0	5.9873	20 { 11 11 11 11	58.1 58.4	11 53.3 5 23.2	0.38730
Oct.	20 8 16	51.2	5.9856	20 { 9 30 9 30	56.8 56.3	11 55.0 5 24.1	0.38778
Nov.	18 10 13	49.0	5.9952	18 { 11 44 11 45	59.0 59.0	11 53.2 5 23.2	0.38667
Dec.	14 10 38	48.5	5.9863	14 { 11 45 11 47	46.0 46.0	11 54.3 5 23.4	0.38698

## MAGNETIC INTENSITY.

BRITISH UNITS.				C. G. S. UNITS.		
1897	Horizontal Force.	Vertical Force.	Total Force.	Horizontal Force.	Vertical Force.	Total Force.
Jan. ...	3·7368	9·6778	10·3737	0·17230	0·44620	0·47830
Feb. ..	3·7388	9·7014	10·3969	0·17239	0·44731	0·47937
Mar. ...	3·7371	9·7087	10·4031	0·17231	0·44765	0·47966
April ...	3·7357	9·6891	10·3845	0·17225	0·44674	0·47880
May ...	3·7342	9·7051	10 3988	0·17218	0·44748	0·47946
June ...	3·7371	9·6301	10·3298	0·17231	0·44402	0·47628
July ..	3·7416	9·6987	10·3954	0·17252	0·44718	0·47931
Aug. ...	3·7380	9·6744	10·3713	0·17235	0·44606	0·47820
Sept. ...	3·7424	9·7416	10·4357	0·17255	0·44916	0·48116
Oct. ...	3·7386	9·6383	10·3380	0·17238	0·44440	0·47666
Nov. ...	3·7361	9·6683	10·3651	0·17227	0·44578	0·47791
Dec. ...	3·7417	9·7076	10·4038	0·17252	0·44759	0·47970
Means	3·7382	9·6867	10·3830	0·17236	0·44663	0·47873

# HORIZONTAL MAGNETIC DIRECTION.

Horizontal Magnetic Direction, west of north, (from daily measures of the continuous curves.)

1897	Mean of the highest daily readings. (a)	Mean of the lowest daily readings (b)	Means of a and b. (c)	Means of daily readings at 4a.m. & 4p.m. (d)	Differences  <i>d-c.</i>	Difference of <i>a</i> and <i>b</i> , or Mean daily range.	Highest reading of the month.	Lowest reading of the month.	Monthly range.
	18° +						18° +		
January	34.4	24.5	29.5	29.8	.3	9.9	53.0	6.5	46.5
February	33.7	21.8	27.5	28.8	1.3	12.4	38.5	9.0	29.5
March	35.6	19.4	27.5	28.7	1.2	16.2	42.3	5.0	37.3
April	35.8	18.1	27.0	28.3	1.3	17.7	46.3	7.0	39.3
May	34.1	20.1	27.1	27.4	.3	14.0	49.6	8.0	41.6
June	31.3	18.6	25.0	25.7	.7	12.7	35.3	10.2	25.1
July	30.8	17.9	24.4	24.9	.5	12.9	45.0	5.0	40.0
August	31.2	17.9	24.6	24.2	+.4	13.8	37.6	12.0	25.6
September	30.6	17.8	24.2	23.8	+.4	12.8	36.5	8.0	28.5
October	29.1	16.8	22.7	23.9	1.2	12.8	33.0	3.5	29.5
November	28.3	17.2	22.8	24.0	1.2	11.1	37.3	6.0	31.3
December	29.6	14.5	22.1	24.0	1.9	15.1	56.4	-15.5	71.9
Means	32.0	18.6	25.3	26.1	.8	13.4	42.6	5.4	37.2
Correction for diurnal range									
				-.8					
Mean for the year				18° 25' .8					



## HORIZONTAL MAGNETIC FORCE.

Magnetic Force in C. G. S. units (from daily measures of the continuous cu

The figures in the columns are entered to the unit  $10^{-1}$  C. G. S.

(a)	Mean of the set daily readings.	Mean of of and $\delta$ .	Means of daily readings 4 a. m. & 4 p. m.	Differ- ences $d-e$	Differences of $e$ and $\delta$ or Mean daily Range.	Highest reading of the Month	Lowest reading of the Month
(b)	(c)	(d)	0+				17000+
277	288	238	261	8	89	290	151
289	285	262	263	1	54	356	91
291	294	263	269	5	57	386	206
303	313	258	268	10	90	372	121
298	217	255	260	5	76	348	166
287	225	256	260	4	62	326	181
277	311	244	253	9	66	326	146
287	207	237	241	4	60	294	136
267	212	240	245	5	55	304	171
272	216	244	245	1	56	313	191
265	223	244	246	2	48	296	174
283	216	250	245	—5	67	481	126
281	221	251	255	4	60	338	155

—3  
for diurnal range

Horizontal Force for the year 0.17252 C.G.S. units.

# DATES OF MAGNETIC DISTURBANCES, 1897.

The disturbances are divided generally into three classes, *small*, *moderate*, and *greater*; these are indicated by the initial letters of the classes, and the letter c denotes *calm*. Very great disturbances are marked vg. The days are reckoned astronomically from noon to noon. The asterisk signifies that the record was partly or wholly lost, according as it stands with or without an initial letter.

Month.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
Day 1	m	s	m	g	*	s	c	m	s	m	s	s
2	g	s	s	s	*	m	s	s	*s	m	s	c
3	m	m	m	s	*c	m	s	s	*	s	c	s
4	s	m	m	s	s	m	s	c	m	s	s	s
5	s	m	s	m	s	s	s	c	s	s	s	s
6	s	s	s	m	s	s	s	c	s	s	s	s
7	s	s	s	m	c	s	s	s	s	c	s	s
8	s	s	m	m	c	s	s	s	s	c	s	c
9	c	s	m	m	s	c	c	m	c	s	s	s
10	s	m	m	s	s	s	s	s	m	m	s	m
11	s	s	s	s	s	c	s	s	m	s	s	m
12	m	s	m	s	s	s	s	s	s	s	c	s
13	s	m	s	m	m	s	s	s	c	s	s	c
14	s	m	s	s	m	s	m	s	s	c	s	s
15	c	s	s	c	s	m	s	m	s	s	c	m
16	s	c	c	m	s	m	s	c	s	s	s	s
17	s	c	s	m	g	m	c	s	s	m	m	m
18	s	c	c	m	s	m	s	s	s	m	m	s
19	c	c	s	m	m	m	s	m	s	c	c	s
20	c	s	c	m	m	s	s	s	s	c	m	g
21	c	c	s	c	m	s	m	s	s	c	s	m
22	c	s	m	s	m	s	s	s	s	s	c	m
23	c	m	s	g	m	s	s	s	s	s	s	s
24	c	s	m	m	s	s	s	c	s	s	m	s
25	s	m	c	m	s	s	c	s	s	s	m	s
26	c	m	c	m	s	s	m	s	c	s	m	c
27	s	m	s	s	s	s	s	s	c	m	s	c
28	m	s	s	s	s	s	s	s	c	m	s	s
29	m		m	s	m	c	c	s	c	m	s	m
30	m		s	*	s	c	m	s	c	s	c	m
31	s		m		s		m	s		s		m
Totals												
c	9	5	5	2	3	4	5	5	7	6	6	5
s	15	13	15	11	17	18	21	22	19	17	18	16
m	6	10	11	14	8	8	5	4	3	8	6	9
g	1	0	0	2	1	0	0	0	0	0	0	1
vg	0	0	0	0	0	0	0	0	0	0	0	0
1 day lost				1	2				1			
2 days lost				0	0				0			

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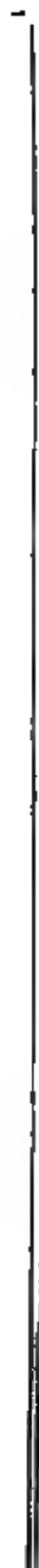
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Rapporto Annuale dell 'Osservatorio Meteorologico di Trieste per l'anno 1894 Radatto da Edoardo Mazelle	Osservatorio
Bollettino Mensuale dell oss. Central del R. Col. Carlo Alberto in Moncalieri 1896-7	„

<b>Determinazioni assolute della declina- zione Magnetica nel R. Osserva- torio di Capodimonte 1892-93-96</b>	
Nota del Dr. F. Angelitti - - -	Osservatorio
<b>Variazioni della declinazione Magnetica 1892 dal medesimo - - -</b>	"
<b>Osservazioni Meteoriche 1894-6. dal medesimo - - -</b>	"
<b>Riassunti decadici e mensuali delle osservazioni Meteoriche 1893 Nota di F. Brioschi, 1894-95 di Dr. V. Alberti - - -</b>	Il Autore
<b>Determinazioni Assolute dalla Inclina- zione magnetica eseguite negli anni 1892-93-95, dal Dr. F. Cantarino - - -</b>	Autore
<b>Sa di un Metodo per Determinare la Latitude Geografica indipente- mente dai piccoli errori delle coordinate delle stelle dal medesimo</b>	"
<b>Sopra un antico Sismometro a mercurio ideato dall Abate A. Cavalli, da Giovanni Agamennone - -</b>	
<b>Terremoto Siculo-Calabro della notte dall' 11 al 12 Febbraio 1897, dal medesimo - - -</b>	"
<b>Rubra Canicula, Nuove considerazioni circa la Mutazione di colore che si dice avvenuta in Sirio da Giov- ani Schiaparelli - - -</b>	"
<b>Osservazioni Astronomiche e Fisiche sull'asse di Rotazione e sulla Topo- grafia del Pianeta Marte dal medesimo - - -</b>	"

APPENDIX  
RESULTS

OF

METEOROLOGICAL OBSERVATIONS

TAKEN AT

ST. IGNATIUS' COLLEGE, MALTA

BY THE

REV. J. F. DOBSON, S.J.

1897.

# ST. IGNATIUS' COLLEGE, MALTA.

Lat. 35° 55' N.

Long. 14° 29' E.

Barometer Readings reduced to 32° F. at sea level.

## METEOROLOGICAL REPORT.

JANUARY, 1897.

Results of Observations taken during the Month.		Mean for the last 14 years
Mean Reading of the Barometer .....	inches 29.998	30.034
Highest .. on the 6th ..	30.298	30.421
Lowest .. on the 22nd ..	29.423	29.570
Range of Barometer Readings.....	0.875	0.851
Highest Reading of a Max. Therm. on the 9th	66.6	65.0
Lowest Reading of a Min. Therm. on the 31st	39.4	41.3
Range of Thermometer Readings .....	27.2	23.7
Greatest Range in 24 hours on the 31st ....	16.3	18.4
Mean of all the Highest Readings .....	60.1	58.9
Mean of all the Lowest Readings .....	49.1	48.3
Mean Daily Range .....	11.0	10.6
Mean Temperature (deduced from Max. & Min.)	58.9	52.9
Mean Temperature deduced (from Dry Bulb)	53.7	52.6
Adopted Mean Temperature .....	53.8	52.8
Mean Temperature of Evaporation .... ..	49.8	48.4
Mean Temperature of Dew Point .....	47.2	45.2
Mean elastic force of Vapour .....	inches 0.325	0.301
Mean weight of Vapour in a cub. ft. of air grains	3.7	3.4
Mean additional weight required for saturation,,	0.8	0.9
Mean degree of Humidity .....	82	80
Mean weight of a cubic foot of air .. grains	540.4	542.3
Fall of Rain .....	inches 1.051	3.680
Number of days on which Rain fell .....	10	14
Mean amount of Cloud (an overcast sky=10)	5.6	5.3
Total number of miles of Wind indicated ....	8614	8442
Mean Velocity of Wind per hour.....miles	11.6	11.3

## FEBRUARY, 1897.

## Results of Observations taken during the Month.

Mean for the  
last  
14 years.

Mean Reading of the Barometer .....inches	30·229	30·031
Highest                   ,,           on the 19th   ,,	30·488	30·329
Lowest                   ,,           on the 1st   ,,	29·582	29·630
Range of Barometer Readings .....   ,,	0·906	0·699
Highest Reading of a Max. Ther. on the 22nd & 23rd	63·0	67·1
Lowest Reading of a Min. Therm. on the 19th	43·2	41·1
Range of Thermometer Readings .....	19·8	26·0
Greatest Range in 24 hours on the 19th.....	18·1	19·4
Mean of all the Highest Readings.....	60·8	60·2
Mean of all the Lowest Readings.....	50·8	49·2
Mean Daily Range .....	10·0	11 0
Mean Temperature (deduced from Max. & Min.)	54·8	53·7
Mean Temperature (deduced from Dry Bulb)	55·7	53·9
Adopted Mean Temperature .....	55·3	53 8
Mean Temperature of Evaporation.....	50·2	49·6
Mean Temperature of Dew Point .....	48·5	46·7
Mean elastic force of Vapour .....inches	0·342	0·320
Mean weight of Vapour in a cub. ft. of air grains	3·5	3·6
Mean additional weight required for saturation,,	1·1	0·8
Mean degree of Humidity .....	75	82
Mean weight of a cubic foot of air.....grains	542·9	540·9
Fall of Rain.....inches	0·492	2·144
Number of days on which Rain fell.....	4	9
Mean amount of Cloud (an overcast sky=10)	5·5	5·0
Total Number of Miles of Wind indicated ...	8626	7826
Mean Velocity of Wind per hour .....miles	12·8	11·7

# MARCH, 1897.

Results of Observations taken during the Month.			Mean for the last 14 years.
Mean Reading of the Barometer .....	inches	30·062	29·995
Highest	„ on the 11th „	30·327	30·349
Lowest	„ on the 16th „	29·563	29·535
Range of Barometer Readings .....	„	0·764	0·814
Highest Reading of a Max. Therm. on the 29th		79·2	73·7
Lowest Reading of a Min. Therm. on the 9th		44·1	43·1
Range of Thermometer Readings.....		35·1	30·6
Greatest Range in 24 hours on the 29th.....		21·1	22·7
Mean of all the Highest Readings.....		64·1	63·2
Mean of all the Lowest Readings.....		51·5	50·9
Mean Daily Range.....		12·6	12·3
Mean Temperature (deduced from Max. & Min.)		57·1	56·2
Mean Temperature (deduced from Dry Bulb)		56·0	55·2
Adopted Mean Temperature .....		56·6	55·7
Mean Temperature of Evaporation .....		52·4	51·6
Mean Temperature of Dew Point .....		49·3	48·4
Mean elastic force of Vapour .....	inches	0·352	0·341
Mean weight of Vapour in a cub.ft. of air	grains	3·9	3·8
Mean additional weight required for saturation,,		1·0	1·1
Mean degree of Humidity .....		79	79
Mean weight of a cubic foot of air..	grains	537·8	537·3
Fall of Rain .....	inches	0·751	1·039
Number of days on which Rain fell .....		7	7
Mean amount of Cloud (an overcast sky=10)		4·5	4·6
Total number of miles of Wind indicated ...		8810	8150
Mean Velocity of Wind per hour.....	miles	11·8	10·9



## APRIL, 1897.

Results of Observations taken during the Month			Mean for the last 14 years.
Mean Reading of the Barometer..... inches	29.990		29.947
Highest                   ,,                   on the 29th                   ,,	30.328		30.251
Lowest                   ,,                   on the 24th                   ,,	29.597		29.542
Range of Barometer Readings .....	0.731		0.709
Highest Reading of a Max. Therm. on the 24th	78.8		76.8
Lowest Reading of a Min. Therm. on the 3rd	47.0		47.9
Range of Thermometer Readings .....	31.8		28.4
Greatest Range in 24 hours on the 13th ....	18.9		21.8
Mean of all the Highest Readings .....	66.6		67.2
Mean of all the Lowest Readings .....	54.8		54.1
Mean Daily Range.....	11.8		13.1
Mean Temperature (deduced from Max. & Min.)	59.7		59.7
Mean Temperature (deduced from Dry Bulb)	58.9		59.4
Adopted Mean Temperature.....	59.3		59.6
Mean Temperature of Evaporation .....	55.0		55.5
Mean Temperature of Dew Point .....	51.5		52.1
Mean elastic force of Vapour ..... inches	0.381		0.390
Mean weight of Vapour in a cub. ft. of air grains	4.2		4.4
Mean additional weight required for saturation,,	1.4		1.3
Mean degree of Humidity .....	77		78
Mean weight of a cubic foot of air .... grains	533.0		531.7
Fall of Rain .....inches	1.847		0.921
Number of days on which Rain fell .....	9		6
Mean amount of Cloud (an overcast sky=10)	5.8		4.6
Total number of miles of Wind indicated....	9535		8275
Mean Velocity of Wind per hour .....miles	13.2		11.5

## MAY, 1897.

Results of observations taken during the Month.			Mean for the last 14 years.
Mean Reading of the Barometer..... inches	29·903		29·987
Highest                   ,,           on the 7th   ,,	30·086		30·181
Lowest                   ,,           on the 27th   ,,	29·527		29·632
Range of Barometer Readings.....   ,,	0·559		0·549
Highest Reading of a Max. Therm. on the 30th	79·3		81·7
Lowest Reading of a Min. Therm. on the 17th	50·1		53·5
Range of Thermometer Readings .....	29·2		28 2
Greatest Range in 24 hours on the 30th ....	22·0		23 5
Mean of all the Highest Readings.....	70·7		72·5
Mean of all the Lowest Readings .....	58·0		58·4
Mean Daily Range .....	12·7		14·1
Mean Temperature (deduced from Max. & Min.)	63·4		64 3
Mean Temperature (deduced from Dry Bulb)	62·3		63·8
Adopted Mean Temperature .....	62·9		64 1
Mean Temperature of Evaporation.....	58·7		60·1
Mean Temperature of Dew Point .....	55·1		56·5
Mean elastic force of Vapour .....inches	0·434		0·458
Mean weight of Vapour in a cub.ft. of air grains	4·9		5·0
Mean additional weight required for saturation,,	1·5		1·7
Mean degree of Humidity.....	76		76
Mean weight of a cubic foot of air.... grains	527·1		526 9
Fall of Rain .....	1·411		0·664
Number of days on which Rain fell.....	8		3
Mean amount of Cloud (an overcast sky = 10)..	5·3		4·0
Total number of miles of Wind indicated ..	8953		7361
Mean Velocity of Wind per hour..... miles	12		9·9

## JUNE, 1897.

Results of Observations taken during the Month.		Mean for the last 14 years.
Mean Reading of the Barometer .... inches	30·032	30·015
Highest                    ,,                   on the 27th	30·172	30·175
Lowest                    ,,                   on the 4th	29·819	29·803
Range of Barometer Readings .....	0·353	0·372
Highest Reading of a Max. Therm. on the 28th	92·8	90·3
Lowest Reading of a Min. Therm. on the 2nd ..	57·7	58·6
Range of Thermometer Readings .....	35·1	31·7
Greatest Range in 24 hours on the 28th .....	27·7	25·4
Mean of all the Highest Readings .....	80·5	80·6
Mean of all the Lowest Readings .....	63·8	64·8
Mean Daily Range .....	16·7	15·8
Mean Temperature (deduced from Max & Min)	71·4	71·9
Mean Temperature (deduced from Dry Bulb)	70·5	71·2
Adopted Mean Temperature .....	71·0	71·6
Mean Temperature of Evaporation .....	65·0	66·0
Mean Temperature of Dew Point .....	60·5	61·9
Mean elastic force of Vapour ..... inches	0·528	0·554
Mean weight of Vapour in a cub.ft. of air grains	5·7	6·0
Mean additional weight required for saturation,,	2·6	2·4
Mean degree of Humidity.....	70	72
Mean weight of a cubic foot of air....grains	520·7	519·7
Fall of Rain .....	0·0	0·068
Number of days on which Rain fell .....	..	1
Mean amount of Cloud (an overcast sky=10)	2·4	2·2
Total number of miles of wind indicated .....	5989	6266
Mean Velocity of Wind per hour .....	8·3	8·7

## JULY, 1897.

Results of Observations taken during the Month.			Mean for the last 14 years
Mean Reading of the Barometer .....	inches	29·949	30·008
Highest	„ on the 24th „	30·108	30·147
Lowest	„ on the 5th „	29·788	29·836
Range of Barometer Readings.....	„	0·320	0·311
Highest Reading of a Max. Therm. on the 15th		97·0	97·9
Lowest Reading of a Min. Therm. on the 31st		66·3	64·6
Range of Thermometer Readings .....		30·7	33·3
Greatest Range in 24 hours on the 3rd .....		26 0	27·2
Mean of all the Highest Readings .....		88·2	87·0
Mean of all the Lowest Readings .....		71·5	69·7
Mean Daily Range..... ..		16·7	17·3
Mean Temperature (deduced from Max.& Min)		79·4	77·9
Mean Temperature (deduced from Dry Bulb)		77·4	77·0
Adopted Mean Temperature .....		78·4	77·5
Mean Temperature of Evaporation .....		71·5	70·4
Mean Temperature of Dew Point .....		67·0	65·7
Mean elastic force of Vapour .....	inches	0·661	0·635
Mean weight of Vapour in a cubic ft. of air	grains	7·1	6·8
Mean additional weight required for saturation,,		3·2	3·4
Mean degree of Humidity .....		69	67
Mean weight of a cubic foot of air .....	grains	511·5	513·4
Fall of Rain .....	inches	0·090	0·033
Number of days on which Rain fell.....		2	0·14
Mean amount of Cloud (an overcast sky=10)		2·0	0 9
Total number of miles of wind indicated ....		6363	5495
Mean Velocity of Wind per hour .....	miles	8·6	7·4

## AUGUST, 1897.

Results of Observations taken during the Month.		Mean for the last 14 years.
Mean Reading of the Barometer . . . . . inches	30·007	30·013
Highest                   ,,                   on the 13th   ,,	30·118	30·163
Lowest                   ,,                   on the 1st   ,,	29·888	29·861
Range of Barometer Readings . . . . .	0·230	0·302
Highest Reading of a Max. Therm. on the 25th	90·2	96·9
Lowest Reading of a Min. Therm. on the 2nd & 31st	66·2	65·8
Range of Thermometer Readings . . . . .	24·0	31·6
Greatest Range in 24 hours on the 3rd . . . . .	23·2	26·0
Mean of all the Highest Readings . . . . .	86·8	87·1
Mean of all the Lowest Readings . . . . .	70·5	70·8
Mean Daily Range . . . . .	15·8	16·3
Mean Temperature (deduced from Max. & Min.)	77·6	78·2
Mean Temperature (deduced from Dry Bulb)	76·4	78·1
Adopted Mean Temperature . . . . .	77·0	78·2
Mean Temperature of Evaporation . . . . .	71·1	71·4
Mean Temperature of Dew Point . . . . .	67·2	66·7
Mean elastic force of Vapour . . . . . inches	0·666	0·655
Mean weight of Vapour in a cub. ft. of air grains	7·2	7·0
Mean additional weight required for saturation,,	2·7	3·4
Mean degree of Humidity . . . . .	73	68
Mean weight of a cubic foot of air . . . . grains	514·1	512·4
Fall of Rain . . . . . inches	....	0·103
Number of days on which Rain fell . . . . .	....	1
Mean amount of Cloud (an overcast sky = 10)	1·2	1·1
Total number of miles of Wind indicated ..	5121	5462
Mean Velocity of Wind per hour . . . . . miles	6·9	7·3

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## OCTOBER, 1897.

## Results of Observations taken during the Month.

Mean for the  
last  
14 years.

Mean Reading of the Barometer . . . . . inches	30·069	30·046
Highest                   ,,                   on the 29th   ,,	30·359	30·261
Lowest                   ,,                   on the 4th   ,,	29·713	29·747
Range of Barometer Readings . . . . .	0·646	0·514
Highest Reading of a Max. Therm. on the 23rd	84·2	87·9
Lowest Reading of a Min. Therm. on the 13th	53·3	55·9
Range of Thermometer Readings . . . . .	30·9	32 0
Greatest Range in 24 hours on the 13th . . . . .	17·3	19 8
Mean of all the Highest Readings . . . . .	72·3	76·9
Mean of all the Lowest Readings . . . . .	62·0	64·6
Mean Daily Range . . . . .	10·3	12·3
Mean Temperature (deduced from Max. & Min.)	67·1	69·9
Mean Temperature (deduced from Dry Bulb)	66·3	69·0
Adopted Mean Temperature . . . . .	66 7	69·4
Mean Temperature of Evaporation . . . . .	60·8	64·8
Mean Temperature of Dew Point . . . . .	57·1	61·2
Mean elastic force of Vapour . . . . . inches	0·467	0·546
Mean weight of Vapour in a cub. ft. of air grains	5·2	5·9
Mean additional weight required for saturation,,	1·7	1·7
Mean degree of Humidity . . . . .	75	77
Mean weight of a cubic foot of air . . . grains	529·0	528·0
Fall of Rain . . . . . inches	2·867	2·767
Number of days on which Rain fell . . . . .	9	7
Mean amount of Cloud (an overcast sky=10)	5·2	4·3
Total number of miles of Wind indicated . . . .	8041	6634
Mean Velocity of Wind per hour . . . . . miles	10·8	8·9

# NOVEMBER, 1897.

Results of Observations taken during the Month			Mean for the last 14 years.
Mean Reading of the Barometer..... inches	30·247		30·067
Highest                   ,,                   on the 12th   ,,	30·452		30·315
Lowest                   ,,                   on the 29th   ,,	29·820		29·706
Range of Barometer Readings                   ,,	0·632		0·609
Highest Reading of a Max. Therm. on the 15th	72·1		77·2
Lowest Reading of a Min. Therm. on the 28th	50·2		50·0
Range of Thermometer Readings	21·9		27·2
Greatest Range in 24 hours on the 2nd.....	19·6		18·2
Mean of all the Highest Readings.....	67·0		68·9
Mean of all the Lowest Readings	55·9		57·8
Mean Daily Range	11·1		11·1
Mean Temperature (deduced from Max & Min)	60·4		62·5
Mean Temperature (deduced from Dry Bulb)	58·3		61·9
Adopted Mean Temperature	59·4		62·2
Mean Temperature of Evaporation.....	55·4		57·6
Mean Temperature of Dew Point	52·1		54·2
Mean elastic force of Vapour                   inches	0·389		0·421
Mean weight of Vapour in a cub. ft. of air grains	4·4		4·8
Mean additional weight required for saturation,,	1·2		1·3
Mean degree of Humidity	78		79
Mean weight of a cubic foot of air     grains	537·5		531·7
Fall of rain                   inches	1·687		3·416
Number of Days on which rain fell	11		11
Mean amount of Cloud (an overcast sky=10)	5·6		5·3
Total number of miles of Wind indicated   ..	6607		6719
Mean Velocity of Wind per hour     miles	9·2		9·3



## DECEMBER, 1898.

Results of Observations taken during the Month.			Mean for the last 14 years
Mean Reading of the Barometer .....	inches	30·170	30·036
Highest	on the 27th	30·596	30·380
Lowest	on the 4th	29·611	29·574
Range of Barometer Readings.....		0·985	0·606
Highest Reading of a Max Therm. on the	4th	66·5	68·7
Lowest Reading of a Min. Therm. on the	20th	45·6	43·7
Range of Thermometer Readings .....		20·9	25·0
Greatest Range in 24 hours on the 7th .....		16·9	17·6
Mean of all the Highest Readings .....		60·7	61·9
Mean of all the Lowest Readings.....		51·6	52·3
Mean Daily Range.....		9·1	9·6
Mean Temperature (deduced from Max.& Min.)		55·5	56·4
Mean Temperature (deduced from Dry Bulb)		55·1	56·1
Adopted Mean Temperature .....		55·3	56·2
Mean Temperature of Evaporation .....		54·1	51·9
Mean Temperature of Dew Point .....		48·0	48·7
Mean elastic force of Vapour.....	inches	0·825	0·844
Mean weight of Vapour in a cub.ft.of air	grains	3·8	3·9
Mean additional weight required for saturation,,		1·0	1·1
Mean degree of Humidity.....		79	79
Mean weight of a cubic foot of air....	grains	541·4	538·3
Fall of Rain.....	inches	3·970	4·193
Number of Days on which rain fell.....		20	14
Mean amount of Cloud (an overcast sky=10)		6·8	5·8
Total number of miles of Wind indicated ..		8166	8286
Mean Velocity of Wind per hour .....	miles	11·0	11·1

## Summary of Observations FOR 1897.

Results of Observations taken during the Year.			Mean for the last 14 years.
Mean Reading of the Barometer.....inches	30 058		30·022
Highest               ,,       on December 27th,,	30·596		30·494
Lowest               ,,       on January 22nd,,	29 423		29·381
Range of Barometer Readings .....	1·173		1·113
Highest Reading of Max. Therm. on Sept. 14th	97·8		99·7
Lowest Reading of a Min. Therm. on Jan. 31st	39·4		40·3
Range of Thermometer Readings .....	58·4		59·4
Greatest Range in 24 hours on June 28th....	27·7		28·9
Mean of all the Highest Readings .....	71·8		72·5
Mean of all the Lowest Readings .....	59·1		59·3
Mean Daily Range.....	12 7		13·2
Mean Temperature(deduced from Max.& Min.)	64·7		65·0
Mean Temperature (deduced from dry bulb)	63 7		64·5
Adopted Mean Temperature .....	64·2		64·7
Mean Temperature of Evaporation .....	59·1		59·8
Mean Temperature of Dew Point .....	55·6		56 1
Mean elastic force of Vapour .....	0·456		0·456
Mean weight of Vapour in a cub. ft. of air grains	5·0		5·1
Mean additional weight required for saturation,,	1·7		1·8
Mean degree of Humidity.....	75		76
Mean weight of a cubic foot of air ....grains	529·4		527·8
Fall of rain .....	14·216		19·701
Number of days on which rain fell.....	81		77
Mean amount of Cloud (an overcast sky=10)	4·3		3·8
Total number of miles of wind indicated ....	91655		84351
Mean Velocity of Wind per hour.....miles	10·5		9·6

### SINCE MAY, 1883.

The Maximum monthly mean height of the Barometer was

in November, 1889, and was ..... .. inches 30·249

The Minimum       ,,       ,,       in January, 1886, and was 29·844

The Maximum yearly mean height of the Barometer was in 1897, and was..... inches	80·058
The Minimum „ „ in 1890, and was.....	29·996
The greatest monthly range of the Barometer was in January, 1886, and was .....	1·201
The least „ „ in August, 1883, and was .....	0·188
The highest reading of the Barometer was on January 26th, 1887, and was.....	30·627
The lowest „ „ on January 17th, 1886, and was	29·155
Extreme range .....	inches 1·472
The highest temperature was on August 11th, 1896, and was	104·8
The lowest „ „ February 19th, 1895 .....	34·2
The highest mean temperature of a month, was in August, 1885, and was .....	83·2
The lowest „ „ „ February, 1891, ..	49·5
The greatest monthly mean weight of vapour } in a cubic foot of air .....	August, 1885 7·9
The least „ January and February, 1891, and was grs	3·0
The highest observed Dew point was on August 30th, 1885, and was .....	78·7
The lowest „ „ February 19th, 1895, and was	27·9
The greatest fall of rain in a month, was in December, 1889, and was .....	inches 8·952
The greatest number of days on which } rain fell in one month .....	January, 1889 .... 24
The greatest fall of rain in a year was in 1889 and was inches	26·044
The smallest „ „ „ 1895 „ „	11·384
The greatest number of rainy days in a year was in 1894 and was	90
The least „ „ „ „ 1888	59
The highest temperature registered in sunshine was on the 15th July, 1897, and was.....	159·7
The lowest temperature registered on ground was on the 19th February, 1895, and was .....	31·7
The highest observed sea temperature was on the 5th August, 1887, and was.....	85·0
The lowest „ „ 30th January, 1895, and was	55·5
The smallest mean amount of cloud observed in one month was in August, 1890, and was .....	0·0
The greatest „ „ in January, 1894, and was	7·2

## NOTES FOR THE SEPARATE MONTHS.

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### JANUARY.

THE Dew-point ranged between  $37.6^{\circ}$  on the 6th, and  $54.6^{\circ}$  on the 16th.

In Sunshine, the highest reading was  $124.3^{\circ}$  on the 19th.\*

On Ground, the lowest reading was  $32.3^{\circ}$  on the 6th.\*

The Sea has fallen to  $56.8^{\circ}$ , averaging  $59.0^{\circ}$ .

Thunderstorms passed on the 19th.

Lightning was seen on the 4th, 12th, 13th, and 22nd.

Hail fell on the 23rd.

Total Rainfall since last June  $12.655$  inches ; the average of 14 years,  $15.201$  inches.

\* No readings on 23rd and subsequent days. Unprecedentedly severe hailstorm at 1.5 a.m. on 23rd. Hailstones of dense ice, reaching in size to that of a hen's egg, fell for several minutes. Much damage was done to skylights and windows of Westerly aspect.

### FEBRUARY.

The Dew-Point ranged between  $38.8^{\circ}$  on the 9th and  $54.2^{\circ}$  on the 23rd.

\*In Sunshine, the highest reading was  $136.5^{\circ}$  on the 25th.

\*On Ground, the lowest reading was .. on the ...

The Sea has risen to  $60.1$ , averaging  $59.1$ .

Thunderstorms passed on the 9th.

Total Rainfall since last June,  $13.147$  inches ; the average of 14 years,  $17.345$  inches.

\* No readings from 1st to 20th inclusive.

### MARCH.

The Dew-point ranged between  $38.4^{\circ}$  on the 9th, and  $57.7^{\circ}$  on the 30th.

In Sunshine, the highest reading was  $154.1^{\circ}$  on the 27th.

On Ground, the lowest reading was  $41.0^{\circ}$  on the 9th.

The Sea has risen to  $62.3^{\circ}$ , averaging  $60.8^{\circ}$ .

Thunderstorms passed on the 8th.

Lightning was seen on the 6th, 7th, 9th, and 31st.

Total Rainfall since last June 13.898 inches ; the average of 14 years, 18.384 inches.

### APRIL.

The Dew-point ranged between  $40.6^{\circ}$  on the 3rd, and  $59.1^{\circ}$  on the 28th.

In Sunshine, the highest reading was  $145.5^{\circ}$  on the 19th.

On Ground, the lowest reading was  $44.0^{\circ}$  on the 13th.

The Sea has risen to  $62.5^{\circ}$ , averaging  $61.7^{\circ}$ .

Thunderstorms passed on the 3rd and 10th.

Lightning was seen on the 5th, 6th, 9th, 18th, and 28th.

Total Rainfall since last June 15.745 inches ; the average of 14 years, 19.305 inches.

### MAY.

The Dew-point ranged between  $44.8^{\circ}$  on the 8th and  $62.6^{\circ}$  on the 31st.

In Sunshine, the highest reading was  $150.0^{\circ}$  on the 5th

On Ground, the lowest reading was  $45.5^{\circ}$  on the 17th.

The Sea has risen to  $67.3^{\circ}$ , averaging  $66.0^{\circ}$ .

Thunderstorms passed on the 4th and 24th.

Lightning was seen on the 28th.

Hail fell on the 24th.

Total Rainfall since last June 17.156 inches ; the average of 14 years, 19.969 inches.

Slight earthquake shocks were felt throughout the island, about 11.45 p.m. on the 27th, lasting three or four seconds. No damage is reported.

## JUNE.

The Dew-point ranged between  $53.1^{\circ}$  on the 13th and  $69.1^{\circ}$  on the 29th.

In Sunshine, the highest reading was  $154.4^{\circ}$  on the 7th.

On Ground, the lowest reading was  $52.3^{\circ}$  on the 2nd.

The Sea has risen to  $76.0^{\circ}$ , averaging  $71.0^{\circ}$ .

Lightning was seen on the 6th, 7th and 8th.

## JULY.

The Dew-point ranged between  $72.3^{\circ}$  on the 7th, and  $58.4^{\circ}$  on the 28th.

In Sunshine, the highest reading was  $159.7^{\circ}$  on the 15th.

On Ground, the lowest reading was  $62.4^{\circ}$  on the 31st.

The Sea has risen to  $82.1^{\circ}$ , averaging  $80.0$ .

Thunderstorms passed on the 5th.

Lightning was seen on the 6th.

## AUGUST.

The Dew-point ranged between  $59.3^{\circ}$  on the 1st, and  $71.9^{\circ}$  on the 5th.

In Sunshine the highest reading was  $157.9^{\circ}$  on the 6th.

On Ground the lowest reading was  $61.8^{\circ}$  on the 2nd.

The Sea has averaged  $80.0^{\circ}$ .

Lightning was seen on the 4th, 16th, and 20th.

## SEPTEMBER.

The Dew-point ranged between  $73.9^{\circ}$  on the 11th, and  $50.6^{\circ}$  on the 21st.

In Sunshine the highest reading was  $156.4^{\circ}$  on the 14th.

On Ground, the lowest reading was  $56.7^{\circ}$  on the 19th.

The Sea has fallen to  $75.0^{\circ}$ , averaging  $78.0^{\circ}$ .

Thunderstorms passed on the 20th and 28th.

Lightning was seen on the 18th, 26th, 27th, 29th and 30th

Total Rainfall since last June  $0.142$  inches; the average of 14 years  $1.144$  inches.

## OCTOBER.

The Dew-Point ranged between  $69.3^{\circ}$  on the 2nd and  $44.7^{\circ}$  on the 26th and 27th.

In Sunshine, the highest reading was  $151.1^{\circ}$  on the 2nd.

On Ground, the lowest reading was  $47.7^{\circ}$  on the 13th.

The Sea has fallen to  $67.0^{\circ}$ , averaging  $69.5$ .

Thunderstorms passed on the 3rd, and 6th.

Lightning was seen on the 2nd, 4th, 14th, 15th, 17th, 20th, 21st, 22nd, and 23rd.

Hail fell on the 6th.

Total Rainfall since last June  $3.009$  inches ; the average of 14 years,  $3.911$  inches.

## NOVEMBER.

The Dew-point ranged between  $60.7^{\circ}$  on the 4th, and  $41.3^{\circ}$  on the 28th.

In Sunshine, the highest reading was  $138.6^{\circ}$  on the 14th.

On Ground, the lowest reading was  $44.5^{\circ}$  on the 10th.

The Sea has fallen to  $65.0^{\circ}$ , averaging  $66.0^{\circ}$ .

Thunderstorms passed on the 20th, 22nd, 26th.

Lightning was seen on the 21st, and 30th.

Hail fell on the 26th and 30th.

Total Rainfall since last June  $4.696$  inches ; the average of 14 years,  $7.327$  inches.

## DECEMBER.

The Dew-point ranged between  $39.9^{\circ}$  on the 1st, and  $55.0^{\circ}$  on the 16th.

In Sunshine, the highest reading was  $130.2^{\circ}$  on the 20th.

On Ground, the lowest reading was  $40.3^{\circ}$  on the 20th.

The Sea has fallen to  $60.0^{\circ}$ , averaging  $62.0$ .

Lightning was seen on the 1st, 4th, 7th, and 8th.

Total Rainfall since last June,  $8.666$  inches ; the average of 14 years,  $11.520$  inches.

### NOTES FOR THE YEAR.

The Dew-point ranged between  $37.6^{\circ}$  on the 6th January, and  $73.9^{\circ}$  on the 11th September.

In Sunshine, the highest reading was  $159.7^{\circ}$  on the 15th July.

\*On Ground, the lowest reading was  $32.3^{\circ}$  on the 6th January.

The Sea has ranged from  $56.8^{\circ}$  in January to  $82.1^{\circ}$  in July.

Thunderstorms passed on 15 days.

Lightning was seen on 41 days.

Hail fell on 5 days.

\*No readings of the minimum temperature on the ground were taken from January 23rd to February 20th inclusive.

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### CORRIGENDA.

In the Summary of Observations for the year 1896 (page 74) the mean temperature of evaporation was given 69.6, should be 59.6.

In the table of Maxima and Minima (page 75) the lowest mean temperature of a month (February 1891) was given 49.8, should be 49.5.

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